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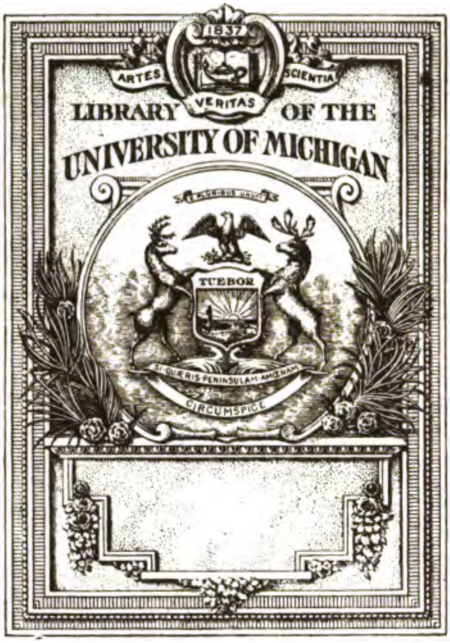

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CONDUCTED

BY W. NEWTON,

CIVIL ENGINEER AND MECHANICAL DRAFTSMAN.

(Assisted by several Scientific Gentlemen.)

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No. XLII.

Recent Patents.

To Samuel Hamilton, *of Threadneedle-street, in the city of London, civil engineer, for his invention of certain improvements in machinery for sawing, boring, and manufacturing wood, applicable to various purposes.*—[Sealed 20th December, 1833.]

The nature of this invention consists, first, in certain horizontal tables or benches, adjustable to various heights and angles of inclination, furnished with graduated scales, guide plates, stops, centre pins, and radius bars, for determining the position, shape, and measure of wood, when manufactured or acted upon by saws or boring instruments, as hereinafter described; secondly, in an improved mode of fitting a horizontal saw, to be worked at such a bench as aforesaid; and, lastly, in a bench for sawing timber on a bevel for shipbuilding purposes. And in further compliance with the said proviso, I, the said James Hamilton, do hereby describe the manner in which my said invention is to be performed by the following statement thereof, reference being had to the drawings annexed, and to the figures and letters marked thereon, it being observed that similar letters are used to denote similar parts in all the figures.

In Plate I., fig. 1, is a horizontal plan of three such tables or benches as aforesaid, two for sawing and one for boring, arranged so as to form one machine, as set up especially for the operation of manufacturing wood into certain parts of wheels; but many parts of which machine, as here shown, are applicable to various other purposes. Fig. 2, is an elevation of the machine, seen through the dotted line No. 1, 2, looking from No. 1, end of the line. Fig. 3, is an elevation of the machine, seen through the dotted line No. 3, 4, looking from No. 4, end of the line. Fig. 4, is an elevation of the machine, seen through the dotted line No. 3, 4, looking from No. 3, end of the line: at fig. 5, are fences and segments to place on the table C, to hold felloes in their proper position, to be bored for the dowels. Fig. 6, is a plan of the apparatus under the table C, intended for boring the naves of wheels to receive the spokes, and to be brought into operation by removing the table or bench. Fig. 7, is a longitudinal elevation; and fig. 8, a transverse section of fig. 6; the two views show the method of supporting the nave while the spoke mortices are being bored, and also of dividing them as wanted: A, A, figs. 1, 2, 3, 4, and 6, is the main framework, to sustain the bearings of the machine. There are three tables placed on this frame, so as to form benches; the one B, figs. 1, 2, 3, 4, seen in front from No. 1, end of the line, is that at which it is intended to cut mitres and tennon shoulders, felloe joints, and other framing work, to any required angle; and at the same time accurately cutting the pieces to any required lengths, by the aid of the gauge plates and scales on the surface of the table, and cutting the shoulders of tennons accurately to depth and length by measures determined, both laterally and vertically, by the gauge plates, which are attached to the bench and frame. The horizontal saw is applied to, or worked at, this bench, and will be described with it. The table C, figs. 1, 2, 3, 4, is that at which it is intended to bore out the spoke sockets in wheel felloes, the spoke mortices in wheel naves, and generally to bore out any work in wood requiring accuracy and dispatch. The table D, figs. 1, 2, 3, 4, is that at which it is intended to cut tennon checks, felloes of wheels, the circular rails of chair backs, chair legs, and other work of the same description, either square in the face, or bevelled to any required angle, or in any required radius or diameter of a circle, thereby saving much time and materials: perpendicular saws are used at this bench, and the mode in which these several objects are respectively effected at the different tables, is herein described as follows, the same letters and figures referring to similar parts in all the several figures. The Patentee firstly describes the horizontal saw and the bench B. In figs. 1, 2, 3, and 4, *a*, is a drum or driving pulley, connected by a band in the usual way to a steam-engine, or any other first mover. This drum *a*, is fitted on the shaft *b*, having the crank *c*, working between two bearings; to this crank is attached a connecting rod *d*, jointed to the heel of the saw and frame *e*: this saw and frame slide in the horizontal gate *f*, which is secured at one end by a pair of saddle couplings *g*, *g*, upon the wings of the crank shaft *b*, and has a balance weight *i*, at the hinder part of the bar *h*, which is tailed upon a fork near the end of the saw gate *f*, and secured by a small connecting rod *k*, and cross head *l*, and a pair of joints to the saw gate *f*, so as to give an effective balance. When the machinery is in motion, the workman pulls the saw down by the elliptical head of the gate in the direction of the arrow on the material lying on the table of the bench B. In this table, immediately under the saw, and in the same line, a small groove allows the saw to clear the table; and the gate slide *f*, being received on the tops of the vertical stops *m*, *m*, the saw may continue in motion, but cannot cut any lower than is required into the material it is working on; and the saw is to be kept accurately adjusted to one descending point by the horns *n*, *n*, working in the cross head slides *o*, *o*, kept apart by the length of the saw by the stretcher bar *p*; the whole sliding in the gate *f*, by the cross head slides *o*, *o*, made in two parts, kept to the gate slides by spring wedges, and two vertical guide-pieces *g*, *g*, at the back of the vertical stops *m*, *m*, keep the saw gate from having any lateral or swaying motion. Below the table B, the shaft *r*, working in bearings on the horizontal supports of the main frame, has a pinion *s*, *s*, in each end; the pinions work into racks *t*, *t*, on the vertical sliding posts *v*, *v*, which are secured at the upper ends to the frame which carries the table B, and these posts slide in vertical sockets in the main frame. On any convenient part of the shaft *r*, is placed a hand drum *u*, by turning which the table of the bench will be elevated or depressed, as required; and when brought to the desired height, is retained there by a ratchet wheel *w*, either on the drum *u*, or on the shaft near the pinion, and a small pall *x*, upon the standard frame; the gauge plate *y*, on the front of the vertical stops *m*, *m*, being graduated in inches and parts, furnishes a scale, by which the table B, may be set, so that the saw *e*, shall only cut any required depth. Along the back of the table B, is a fence cleet *z*, whose face is a line exactly rectangular with the saw *e*; in front of this cleet is a metallic scale *a* 1, of inches and parts, measured from the saw as a common centre. In front of this scale a slot opens into a wider groove in the table below, which groove receives the head of a bolt, the front of which comes up through the gauge clamps *b* 2, and holds them at any desired distance by a nut. The material to be sawed being placed down against the fence *z*, with one end against the gauge clamp *b* 2, will now be sawed successively into pieces the precise length required; and this material is to be held in place by two file-faced holding clamps *c* 2, *c* 2, jointed on to the points of two crooked bars *d* 2, moved by the lever *e* 2, both the clamps and lever having their common centre in the cross shaft *f* 2, and the balance bar and weight *g* 2, to return it upwards. When the lever is pulled in the direction of the arrow, the clamps will press on the material to be sawed, and hold it securely in its place. Upon the workman releasing the lever and saw gate, they go up while he shifts the material; and on pulling them down, the machine repeats the previous operation. The dotted lines *h* 2, on the face of the table B, indicate fence or guide boards, placed by pins in holes in the table at angles of 45°, thus making a correct mitre joint, by cutting the material with the saw on either side: and this part is capable of being varied to any required angle or degree, by changing the face of the fence. The excentric circular lines *i* 2, are parts of circles, increasing in diameter as their centres recede from the back centre of the gauge scale; and, being numbered to their respective diameters on the metallic plates *k* 2, have also a set of figures on their perimeters, showing that so many segments or pieces will make a circle: thus enabling the workman to deliver wheel felloes, or any similar work cut to a length and joint, that will make, in a certain number of parts, a complete rim of a wheel; the gauge clamp *b* 2, and one of the clamps *b* 2, giving the exact form and length required. By these means, various descriptions of cross-cutting work can be done on this bench, with the certainty, that when the saw and the several gauge clamps, and the table of the bench, are once correctly set, every cut made, and all the pieces of the material produced, whatever may be their form or angles, will be exactly alike, the saw always moving in one uniform direction, and cutting to one uniform depth, according as it is set for the particular work required.

It is only necessary here to observe, that various scales and guide plates may be fitted to such a bench table as that marked B, adapted to any particular work that may be required to be performed at it.

The Patentee now proceeds to describe the bench marked C, at which boring is to be performed.

The table of the bench C, is fitted with a set of pinions and racks, ratchets and palls, to raise, depress, or secure it at any needful elevation, in exactly the same manner as the table of the bench B, is fitted; and the same lettering applies to the similar parts of this portion of the machinery in each bench. On this end of the crank shaft *b*, is a fly wheel E; and outside of that a screw, serving the purpose of a mandril nose upon which to receive the chuck *m* 2, which carries the auger or boring bit *n* 2, shown as ready for use. Across the face of the table C, are two metal plates, having each a slot in them their whole length, in which the pins of the guide fence *o* 2, slide, which keeps the fence at any distance on the table always at a rectangle to the centre of the working auger or boring bit. Any material which is to be bored is placed in front of the fence, and both pushed towards the auger or bit, which will then bore an accurately rectangular hole; and the depth of this hole is to be regulated by the stop bar *p* 2, moving, and secured, in the slots *q* 2, set according to the length of the auger or bit, by the gauge plates at each end. When boring the felloe of a wheel to receive the spokes, a segment *r* 2, having one straight side, and the other a concave segment cut to the same radius, as the outside of the wheel felloe is placed with the straight edge to the front of the fence *o* 2, and held by two pins entering into corresponding holes; the felloe to be bored having been cut to an accurate length on the bench B, is first placed with one end against the stop *s* 2, then pushed up to the auger; and when one hole is bored, is slidden without raising or turning, so as to bring the other end against the stop *t* 2, when the second hole is bored; each felloe will thus be bored successively with the holes equidistant from each end, and with a space between each hole in the felloe equal to that between both holes; and the end and each hole will be in a straight line from the centre of the wheel. When boring the end of the felloe to receive the dowel, another pair of fence boards *v* 2, fig. 5, is placed on the table C, and regulated by pins working in the slots *u* 2: a convex segment *w* 2, is laid against the fence boards *v* 2, the felloe being placed against, and held by pointed studs in the segment, is now slidden up against the auger; and a hole, centrical and parallel with the sides of the felloe, is bored to receive the dowel. To prevent misfits at the ends of the felloes from boring them with the opposite sides downwards, the same operation takes place at the opposite end of the felloe, by merely turning ends with the felloe, without lifting it up, and placing the concavity of the felloe against the convexity of the guide segment, which, having been properly adjusted, the rim of the wheel may be put fully together with the concave ring, and one face flush and fair all the way round. If more convenient, from the felloe being small, the same operation may be effected by having one smaller segment, with a concave face set against the smaller fence, shown in fig. 9. When one end is bored in the position shown, the segment is to be turned over, and laid against the opposite fence board; and the felloe shifted end for end, without lifting up, which will give the same operation upon the opposite end of the felloe with the same side downwards; and the gauge scales, shown in fig. 5, will enable the workman to adjust the fence boards for these, and for any other similar purposes. When this portion of the machine is employed to bore the spoke mortices in the naves of wheels, the table of the bench is to be removed; and the apparatus shown in figs. 6, 7, 8, is brought into operation: *a* 3, is a mandril or arbor, which is to pass through and receive the nave, fitted at one end to the dividing plate *b* 3, divided in the usual manner, and held to any position by the index arm and pointed pin *c* 3, the whole being supported in the centres of the puppet heads *d* 3, which are attached to a sliding carriage and frame *e* 3, the bearers of which on the main standard frame are to be so placed, that the centres of the puppet heads and carrying mandril are always accurately in a line with the centre of the working auger or bit, the pin of the index arm being set to the required number on the dividing plate; the puppets heads and mandril, with the nave to be bored, are now slidden successively, so as to bore the first part of each hole required; the carriage *e* 3, on which the puppet heads are fixed, slides on the frame beneath, and is secured by a bolt at each end, working through slots in the carriage: these slots allow the carriage to be shifted longitudinally, so as to bring the nave into the proper position to have the second part of the mortice holes bored, and one of the screws through the carriage of the puppet head gives a central point, so as to allow the mandril being shifted to bore the mortice holes, according to the dishing of the spokes. At the other end a slot in the carriage or sliding frame allows that end of the carriage to be shifted in or out to the required angle for the dishing; and it is held there by a bolt and screw long enough to work through both slots: if needful, the feet flanges of the puppet heads may be made so as to allow longer slots in their sliding direction, for the purpose of boring out mortices of greater length than those indicated by the drawing. When the nave, to be bored for the spoke mortices, is not already bored for the axle, and the mandril cannot be used, a stud chuck, *f* 3, fig. 10, on the centre of the dividing plate, is to be used; and a similar chuck *g* 3, on the centre screw of the opposite puppet's head: these will give the needful support and facility for dividing, while the nave is being bored for the mortices. The lateral movement to and from the tool is effected by the workman's hands, or may be caused by a horizontal screw, working in a nut under the frame, which will carry the puppets heads. By these various facilities, this portion of the machinery is competent to perform various kinds of boring.

I will now proceed to describe the third bench D, at which the perpendicular saws are to be used. Under the bench D, is the crank and shaft H, having at one end the driving drum F, to connect this part of the machine to steam, or any other power, as a first mover; at the other end of the crank and shaft H, is a fly wheel G; and on the crank H, is a connecting rod *h* 3, jointed to the vertical saw frame *i*, 3, which is made with one side rail *k* 3; a cross head and foot rail, each having a scale of inches and parts on one side, the saw No. 1, remaining at unity: the other saw, No. 2, may be placed at any required distance; and the fence board (shown detached in fig. 11,) placed to the required distance from the saw No. 1, or unity, and the No. 2, saw next the material to be worked, on being held down to the table by the pin *l* 3, in the slot bar *m* 3, secured in the fence board by the screw and nut *n* 3. The saw frame thus made slides up and down by the motion of the crank H, at the side of the guide post I, on which the slides No. 3, are fixed (as shown in the detached figs. 12, 13), by which the side rail *k* 3, is steadied; and also between the guide posts K, K, or the slides may be made as shown in plan in the detached figs. 14, 15. The counter weight *o* 3, in the end of the bar *p* 3, attached to the crank H, being equal (with the leverage) to the weight above the crank, will equalise the lift and fall of the saws; or one side of the fly wheel G, being made lighter in the same proportion, will attain the same object. These first saws are for cutting cheeks of tennons, slitting small materials, and any other small straight work, which is to be gauged by the fence board *q* 3, shown detached in fig. 11, adjusted by the gauge plates *r* 3, and screwed down to the face of the table through the arms and slots *s* 3, the longitudinal measure being given by the stop cleet No. 4, on the face of the table; outside of the guide posts K, K, which have a second set of sliding pieces *t* 3, to steady the saw frame *i* 3, another saw or two, if needful, are to be placed.

The table of the bench B, is made in two parts, strongly jointed together at *v* 3; and the part next the outer edge of the bench is made to run from the standard frame below, so as to make an acute angle with the saws by a screw *u* 3, through a swivel nut *w* 3, the carriage of which is on a plate screwed to the standard frame. This screw *v* 3, is housed at the upper end in a swivel socket *x* 3, the carriage of which is on a plate screwed to the under side of the table in the same way as the swivel nut. A washer and pin through the point of the screw finishes the connexion of the screw with the table D; in place of the screw, two toothed segment racks, with pinions and ratchets working in a common arbor, may be used. When thus raised up, any material that is placed on this part of the table will be cut by the saws, Nos. 1, and 2, at the coequal angle or bevel. This bench is also intended to cut circular by the material being set on the radius arms, and apparatus hereafter described; and by the union of the bevelling screw and radius arms, wood may be manufactured or cut, both circular and bevelled, to any required angle or radius.

Upon the face of the table, and in a parallel line with the saws and frame *i* 3, are two metallic plates 2, 2, having a slot between them, and a gauge scale on one plate measured in inches and parts from the outer face of the saw next to the posts K, K: these are also shown in the detached figs. 16, 18, 21.

In the slot, the pin 1, shown detached in fig. 16, having a two-part head, is placed: the pin coming above the gauge bar 2, has a nut 4, screwed on its lower part, securing a small plate 3, which forms an index finger, whose square side is in a line with the centre of the pin 1, and at a right angle to the gauge plate 2: the radius bar 5, fig. 16, has a pin 6, similar to pin 1, going though it; and through the slide piece 7, held by the nut 8, in the slide 7, is a hole, which is placed so that pin 1, goes through it. At the end of the radius bar the segment 9, receives the material to be sawed, which is then firmly held on the segment by the holding piece 10, having a sliding clamp 11, and screw 12, upon it; and the material will now travel to the saw and be cut in the arc of a circle, whose radius is denoted by the index finger 3, and gauge plate 2. A sliding piece 13, placed across the slide 7, has a slot, which allows it to be secured at any required space across the slide 7; and a hole in the opposite end to receive the pin 1, will enable the workman to cut pieces for chair legs in the form of fig. 17, or any required similar eccentric forms. When it is required to saw a plank whose width is greater than the radius of the circle required to be worked on, the bars are to be changed, as shown in figs. 18, 21, by placing the radius bar and dog 5, upon the back centre slide plate 14, which slides under the segment 9, at one end. Two shoulder studs keep the radius bar steady; and at the other end a pin 15, goes into a hole in the stud of the bottom plate 16, shown detached in figs. 19, 20, secured to the under side of the gauge plate by the pin and nut 17, at the centre of the required radius; which centre is now between the holding dog 10, and the working saw, and an arc or segment may be cut of a less radius than the width of the plank which it is sawed out of. In these last described operations, the material is received upon a metal segment 18, on the face of the table, of the same thickness as the segment on the radius bar, which is shown by dotted lines as between the saw No. 1, and the post K, but may be placed between the saw and radius segment, if required. The holding down of the material on the table is effected by the rollers 19, 19, and the forked end of the bar 20, which is steadied by the box 21, sliding between the posts K, K, at the upper end of the bar 20. The lever 22, is jointed, and attached at the outer end to the screw 23, by which the pressure of the rollers 19, 19, on the material is effectively regulated. A feed strap 24, passing round the horizontal roller 25, having a hook at one end of the strap, and the other end attached to the small spindle and winch 26, is hooked to the material; and by this the workman is enabled to draw the material on as it is cut by the saw or saws needful to perform the cutting most effectively. By placing the centre on which the table lifts in a line with the outer side of the saw No. 1, and with the surface of the table itself, no variation will occur between the distance indicated by the gauge plate and the actual distance of the centre from the lowest working point of the saw. By the operation of the bevelling table, the radial bars, scale, segment, and holding clamps, as above described, materials may be sawed to the sweep of any circle within the reach of the machine, with any bevel or angle that may be required: thus giving facility, and saving material, in sawing out the back rails of chairs and chair legs, felloes, of wheels, and any similar work required to be cut in a curve, either with square or bevelled edges.

The drawing marked D, represents a table or bench of the improved construction, adapted particularly to the sawing of ship timber, where constantly varying bevels are required, and where, from the weight of the pieces of wood to be manufactured or sawed, considerable power is required to present them in the required position to the saw to attain that object. Fig. 1, is a plan of a bench for this purpose: A, A, A, A, are the end and side frames of the bench; B, B, is the main bed or table of the bench, supported by and turning on the axes at each end C, and D; the machinery which causes this main bed to turn on its axes will be hereafter explained: E, E, is an adjusting bed resting on the main bed, and furnished with the eight rollers or castors marked F, to facilitate its traversing motion. This adjusting bed turns on an annular or hollow centre at G, through which the saw (the cross head of which is marked *f*,) works, and can be adjusted to various angles, as shown by the dotted lines on this figure, by means of the wormed or screwed shaft H, turned by the hand wheel I. This wormed shaft, which is under the main bed, turns in a nut fixed to the under side of the adjusting bed E, E; and there is a slot cut in the main bed to allow the said nut to traverse. Besides the traversing motion given by the screw shaft H, to the adjusting bed E, E, it has another motion given to it at its annular centre by means of a second screwed shaft J, turned by the hand wheel K. This second screwed shaft is also placed under the main bed, and turns in the nut at L, which nut works in a slot in the shaft M, which moves from a fixed centre at

M, and has a slot in it at O, which takes over a pin or stud fixed to the under side of the square sliding frame P, P. Now the annular centre or ring Q, is bushed into this sliding frame P, P, which rests and slides over the aperture R, R; and it is evident from this arrangement, that if the second screwed shaft J, be turned, the bar M, will be drawn by the nut L, to one side or the other, according as the hand wheel K, is turned, and will drag with it the square frame P, P, and annular centre G, by means of the stud in the slot at O. If the screwed shaft H, be not acted upon the while, then its stud will become the centre, on which the adjusting bed turns; and thus two distinct traversing motions are given to the adjusting bed. The mode of giving various angles of inclination to the main bed, and consequently to the adjusting bed which is upon it, will be better explained by other figures.

Having now described generally the action of the bed, or table of the bench, it only remains for me, as far as this figure is concerned, to describe the mode of placing the timber which is to be cut on the bed, and bringing it forward to the saw during that operation. For this purpose a false bed frame or carriage S, is placed on the adjusting bed, of the same width as the adjusting bed, resting on two angular rails at each side; to this the timber is fastened by dowels or clamps in the usual manner; and with the chain T, which passes over a drum shown in another figure, is drawn this carriage with the timber on it to and fro.

Fig. 2, shows the manner in which any required inclination is given to the main bed of the bench. This may be done by simply applying the hand of the operator to the handle U, or it may be done by palls acting upon the toothed wheels V, and W, as will be shown in the next figure, where the bevel required is regularly progressive in its variation. The latter mode will be found most effectual where it is irregular; the former mode may be resorted to.

Fig. 3, is a longitudinal section of the bench represented by a plan view in the last figure: X, is the perpendicular saw worked by the crank Y, which is on the main working shaft with the fly wheel Z. On the main shaft there is also a cam *a*, which, at every revolution of the shaft, strikes the friction roller *b*, at the end of the rod *c*, and drives it forward to the extent of the excentric on the cam, while the inclined position of the rod allows the return action to take place by its own gravity; for which purpose it moves loosely in the guides *d, e*, which support it. At *g*, is a cross head to the rod, carrying two palls or clicks *h*, and *i*: these clicks take into the ratchet wheels V, W, one of which only can be seen in this figure, but which have their teeth set different ways; so that when the pall *i*, is in gear, the main bed is inclined one way, and when the pall *h*, is in gear, an opposite inclination is given to it. The small screw *j*, is to adjust the distance which the pall is to recede from the ratchet wheel at each stroke of the rod, thereby determining the number of teeth it is to progress at each revolution of the cam, and thus obtaining the exact degree of increase or diminution of the angle of the bevel of the timber which may be required during the progress of the sawing process.

It will be observed that the palls *i, h*, are furnished with short lever arms, which are fixed by a pin to the cross bar *g*, when it is required to hold either of them in gear, which is the case with the pall *i*, in this figure: *k*, is the chain drum mentioned before, but which could not be shown in the last figure; *l, l*, is the timber to be sawed, placed on the timber carriage s, which, it has been before stated, slides on rails, but which rails are omitted in this figure to prevent confusion in the lines, but are clearly exhibited in fig. 4, by the letters *r, r.* This figure is an end view of the bench; but as similar letters are used to denote similar parts in all these figures, it will be unnecessary to give any further description of the three last figures than what a reference to the letters on fig. 1, will furnish, except that, I should add, *p,* is the ratchet wheel for drawing the timber up to the saw as it is cut, and is moved by a cam on the main shaft acting upon an inclined rod, with a cross head carrying the clicks or palls precisely on the same plan as that shown to drive the ratchet wheels *v,* and *w.*

In conclusion, I claim as my invention the following improvements, that is to say:—Firstly, the arrangement of the horizontal tables or benches B, C, and D, adjustable to various heights and angles of inclination, furnished with graduated scales, guide plates, stops, centre pins, and radius bars, as aforesaid, for determining the position, shape, and measure of wood, when manufactured or acted upon by saws or boring instruments, as hereinbefore described. Secondly, the mode of fitting the horizontal saw, hereinbefore described, as used at the bench B, with the balance weight *i,* the saw gate *f,* in which the saw frame works, and its saddle couplings *g, g.* And lastly, the bench, hereinbefore described in the figure marked R, for sawing ship timber to a bevel. And such my invention being to the best of my knowledge and belief entirely new, and never before used within that part of his Majesty's United Kingdom of Great Britain and Ireland called England, his dominion of Wales, and town of Berwick-upon-Tweed, I do hereby declare this to be my specification of the same; and that I do verily believe this my said specification doth comply in all respects fully and without reserve or disguise with the proviso in the said hereinbefore in part recited Letters Patent contained, wherefore I do hereby claim to maintain exclusive right and privilege to my said invention.—[*Inrolled in the Inrolment Office, June,* 1834.]

To CHARLES CLEVELAND, *of Falcon-square, in the city of London, clerk, for certain improvements on pens, on pen-holders, on apparatus for the supplying of ink to pens, and on apparatus for the making of pens, being a communication from a foreigner residing abroad.*—[Sealed 9th February, 1835.]

THESE improvements are divided into four general heads, as applying, firstly, to a peculiar kind of metallic pen; secondly, to certain peculiar sorts and constructions of pen-holders; thirdly, to apparatus for giving suitable supplies of ink to pens; and fourthly, to apparatus for cutting and making pens from quills.

The improvement on pens constituting the first head of the invention, consists in peculiar modes of forming the points of the nibs of metal pens of greater substance of metal than usual, in order to prevent the liability of the points catching in or perforating the paper in the act of writing; and for the purpose of giving sufficient pliability to such nibs, the substance of the metal of which the other parts of the pen is formed is reduced to any required thinness, and in tempering such pens, to obtain permanent elasticity, the points of the nibs are left particularly hard, by inserting them into a bed of clay when the pens undergo the process of tempering; or this hardening of the points of pens might be obtained by other known means. In some cases, I apply to the barrels of these and other kinds of metallic pens, bands or ferrules of metal, which may be moved up or down the barrel of the pen, for the purpose of regulating the elasticity or pliability of the nibs, by more or less confining their action at the longitudinal slits or openings.

The second head of the invention, comprehending certain peculiar sorts and constructions of pen-holders, consists, in the first place, in making the shells or cases for pen-holders of *papier maché*, for the advantages of lightness, cheapness, and external ornament; secondly, in attaching to a pen-holder a shield, in the form of a pen, and producing the nibs by two small parallel rods of metal, which nibs may be lengthened or shortened at pleasure, merely by sliding the rods to the length of nibs desired; thirdly, in forming the shield of the holder with a recess, suited to receive the barrel or stem of a narrow metallic pen, to be confined by a fixed clip and a sliding ferrule, for the purpose of regulating the flexibility of the nibs.

The third head, consisting of an apparatus for supplying ink to pens, may be denominated a fountain pen-holder, in which a piston acts in a cylindrical chamber, for the purpose of filling the chamber with ink, by exhausting the air on the principle and in the manner of a pump or syringe, the ink being allowed to flow out, to feed the nibs of the pen by its own gravity, through a small tube, the egress of which is regulated by an air valve.

The fourth head is an apparatus of an improved construction for making pens, consisting of a small portable machine, into which the barrel of a quill is to be introduced, for the purpose of being cut, nibbed, and slit into the form of an ordinary quill pen, as usually cut by a knife.

In the accompanying figures, fig. 22, Plate I., represents a piece of sheet steel, which should be in thickness about what is denominated twenty-four gauge, out of which plate or sheet several pens, as fig. 23, have been cut by the ordinary operations of the screw press. Previously to cutting the pens, a groove is made in the metal plate, as at *a, a,* by means of a planing machine, or by any other suitable and expeditious apparatus; and when so grooved, the pens punched out and shaped will assume the appearance represented in profile at fig. 24, having thickened nibs. Instead of grooving the plate of metal in the way described sometimes, by means of rollers, the substance of the plate of metal is reduced, generally leaving ribs at certain distances apart, by means of a groove cut in one of the rollers; and on cutting the pens from these ribbed plates, care is taken that the ends of the nibs shall be formed out of the thick or ribbed parts of the plates. By these means, sufficient thickness of the nibs is obtained, to prevent their catching into or penetrating the paper in the act of writing, and at the same time sufficient flexibility of the nibs, to allow the pens to write freely and pleasantly.

The sliding clip or ferrule, which is to regulate the flexibility of the nibs of a pen, is shown attached to the barrel of a metallic pen in fig. 25. This figure exhibits a finished pen, having three slits; *b*, is the clip or ferrule, capable of being slidden along the barrel. When it is intended to stiffen the nibs, the clip or ferrule *b*, is to be moved toward the points of the pen, when a greater degree of freedom of action is required, the ferrule or clip *b*, must be slidden up the barrel. In this way the length of the slits or openings of the pen may be regulated, and any desired degree of flexibility of the nibs may be attained by moving the slide.

The improved pen-holder, shown at figs. 26, and 27, has a shield of metal *c*, formed with any convenient slits or openings, to give more or less flexibility, as may be required: *d*, is a tube, capable of sliding within the shield by means of a thumb piece *e*. Into a plug of cork, or any other suitable material fixed in the tube *d*, the ends of two fine rods of metal for forming the nibs are inserted, as shown at *f*, in fig. 28. The outer extremities of these rods are passed through clips *g*, in the ends of the shield. It will be perceived that any desired length of nibs may be obtained by sliding the tube forward or backward, and that the spring of the nibs, in the act of writing, will depend upon their length and on the flexibility of the shield.

Figs. 29, and 30, exhibit another form of shield and holder *h*, having a recess or indentation *i*, *i*, to receive the stem or barrel of the pen *k*, as at fig. 31. The stem or barrel of the pen is confined in the holder *h*, by two clips or projecting pieces, and the flexibility of the nib is regulated by sliding the ferrule *b*, as before described.

The fountain pen-holder is shown at fig. 32, an external view, and in longitudinal section at fig. 33; all the parts being in these figures connected in their proper positions. Figs. 34, 35, and 36, show the several parts detached, the respective letters of reference pointing out the same parts.

Fig. 34, shows the fountain pen-holder in another position, its cap piece being detached. Figs. 35, and 36, represent the several parts of the pen-holder separated: *a*, *a*, is a cylindrical chamber, or reservoir, to contain the ink; *b*, is the fountain tube for conducting the ink to the pen. This tube has a socket piece and plug *c*, which screws into the end of the cylindrical ink chamber *a*; and through a large orifice in the plug *c*, the ink is intended to flow. A shield *d*, fits into the socket of the plug *c*; and the pen *e*, is held either on the inside or outside of the shield *d*, by small clips. A piston rod *f*, made fast to the knob or head *g*, is inserted into the chamber *a*, working through a guide collar *h*; and a tight piston *i*, within the chamber *a*, may be occasionally connected to the rod by means of the left-handed screw at the end of the rod.

The parts being all put together, as shown at figs. 32, and 34, the knob *g*, and rod *f*, must be so turned, as to cause the screw at the end of the rod *f*, to take fast hold of the piston *i*; the piston must then be slidden along the cylinder, toward the plug *c*, for the purpose of expressing the air. The end of the bent tube *b*, being then inserted into a vessel containing ink, on drawing the piston *i*, up the cylinder, the ink will, by the external pressure of the air, be caused to follow, and occupy the interior. The rod *f*, must now be disengaged from the piston *i*, and the latter allowed to remain stationary at the back end of the chamber, as shown in the section fig. 33, when the rod *f*, may be pushed forward into the chamber, and the cap piece *l*, put on, as shown in fig. 33, which renders the apparatus ready for use.

As the ink cannot flow out of the chamber *a*, without allowing the air to occupy its place, a small air valve *m*, having a conical stopper, is formed in the plug *c*, which, when closed, prevents the ingress of air to the chamber, and consequently stops the flow of ink through the tube; but when this valve *m*, is opened, the air is admitted into the chamber, allowing the ink to discharge itself by its own gravity, and which then flows through the bent tube toward the nibs of the pen.

It will be perceived that a small nib projects from the air valve *m*, through the side of the socket *c*; this is intended to be acted upon by an angular notch in the cap piece *l*, which, when the cap is put over, the pen operates as a bayonet, fastening and pushing the cap piece home on the socket *c*, causing the valve *m*, to be closed; but in drawing off the cap piece previously to using the pen, the nib of the valve *m*, will be drawn forward, and consequently the air valve will be opened, allowing the ink to flow freely through the fountain tube to the pen in the act of writing.

This air valve may be differently constructed, and may be acted upon by a lever, or other convenient mode under the command of the hand, in the act of writing.

The improved pen-cutter, which forms the fourth head of the invention, is shown in several positions in the figures. Fig. 37, is a side view of the improved instrument; fig. 38, is a back view of the same; and fig. 39, may be called a front view, the instrument in this figure being thrown open.

The construction of an instrument of this kind for cutting quills is well known; it is therefore desired to be understood, that this invention of improvements in apparatus for cutting pens consists, firstly, in making the ordinary cutters *a, a*, in two separate pieces; secondly, in forming them with square edges, the object of which is, that they may be readily sharpened when required; thirdly, in so mounting the slitting cutter *b*, that it may be adjusted to produce any length of slit required.

These cutters may be attached, in any convenient way, to one of the chaps of the instrument, which opens upon a hinge joint at *e*, the counter cutter or bed *d*, of the ordinary form and construction being attached to the other chap *e*.

It is proposed to move the slitting cutter *b*, longitudinally by a finger screw *f*, or by any other convenient means.

A quill *g*, being placed in the instrument, as shown at fig. 37, and the upper chap raised, a curved cut will be formed in the barrel of the quill by the curved cutter *h*; and on drawing the quill out of the instrument, a portion of the barrel will have become cut or scooped away, the quill being by that means prepared for the subsequent operation of slitting, cutting, and nibbing. On introducing the quill again into the instrument in this prepared state, and closing the chaps, the nibs will be formed by the shear-like action of the cutters *a*, *a*, and the counter cutter or bed *d*; and the central cutter *b*, will, at the same time, penetrate the quill, and produce the required slit. Fig. 40, shows the cutters *a*, *a*, and *b*, separate, and detached from the instrument.—' [*Inrolled in the Rolls Chapel Office, August*, 1835.]

Specification drawn by Messrs. Newton and Berry.

To WILLIAM WELLS, *of Salford, in the county of Lancaster, machine-maker, and* GEORGE SCHOLEFIELD, *of the same place, mechanical draftsman, for their invention of an improved apparatus or machine for cutting the pile or cords of fustians, and other fabrics manufactured of cotton, wool, and other fibrous materials.*—[Sealed 20th November, 1834.]

THIS invention of an improved apparatus or machine for cutting the pile or cords of fustians, and other fabrics manufactured of cotton, wool, and other fibrous materials, consists in the combination and arrangement of certain parts or pieces of mechanism constituting a machine for cutting open the woven ribs or cords of fustians, and such sort of goods, preparatory to their being dressed with a pile upon the surface. In this machine is mounted a series of knives, formed exactly like those knives which are commonly used for cutting the cords of fustians when the operation is performed by hand.

In the ordinary mode of working by hand, a single cord only is cut open at one operation by the skilful workman guiding the knife along the piece, and keeping its point carefully in; but in this machine a series of knives are enabled to act simultaneously, and to cut many cords in width at the same time from end to end of the piece without interruption, the corded fustian being extended on rollers, and drawn progressively forward under the knives. There is also a provision, in the event of any one of the knives slipping out of the cord in which it is intended to operate, or of passing through the fabric, or of being, by any knots in the cords, or other means, obstructed in its work, that the operations of the machine will be instantly stopped, in order that the error may be corrected before any further mischief occurs.

In the accompanying figures, fig. 1, Plate II., is a side view or longitudinal elevation of the machine, taken geometrically; fig. 2, is a horizontal view of the same, showing the machine as it would appear from above; fig. 3, is an elevation of the machine, taken at the right-hand end of figs. 1, and 2; in all which figures the several parts of the machinery are respectively marked with similar letters of reference: A, A, A, are the standards and framework supporting the machinery, which is preferred to be made of cast iron. It is braced together by transverse bars on stays B, B. Two cylinders or drums C, D, are mounted in the machine, turning on axles supported in plummer blocks on the side rails near the ends of the frames.

Round the periphery of the drum C, the whole length of the piece of corded fustian E, E, is to be wound in the first instance, and its end being then passed through the machine, and its waste end or forcel made fast to the drum D, the rotation of the drum D, on its axis, will cause the length of the piece to be drawn forward under the cutting knives, and be wound upon the periphery of the drum D; the rotary motions of the drums being produced by toothed gear, described hereafter.

One of the cutting knives is represented detached at fig. 4, on a larger scale than it could be shown in the figure of the entire machine: *a*, is the sharp steel point, formed as the cutting part of such knives usually are when intended to be applied by hand to cutting open the cords of fustians; *b*, is the shaft of the knife; and *c*, is a socketed handle, by which it is held in the machine; *d*, being a spring rest, into which the end of the handle is inserted, for the purpose hereafter explained.

Fig. 6, is a sectional representation of a part of the machine detached, for the purpose of showing the cutting operation more clearly than it could be seen in the views of the entire machine. In this figure one of the knives is seen in operation; the fustian E, E, being stretched in the machine under the roller F, and over the roller G, for the purpose of laying it and conducting it along under the knife at such an angle as may be desirable, for applying the points of the knives with the best effect to cut open the cords as the fustian advances.

A series of the knives (any convenient number) are placed side by side in the machine, extending longitudinally in the way that one knife is shown in figs. 1, and 2. The point of each knife so placed is to be inserted into the rib or cord which it is intended to cut open, and the hinder part of each knife is let into the socket or rest *d*, of a circular spring G. A number of these circular springs, equal to that of the knives intended to be applied, are to be fixed on a transverse bar *e*, *e*, extending across the machine, as shown at fig. 3.

The knives being so arranged, the axle of the drum D, is to be thrown into gear with the driving machinery, and the drum C, released so as to run round freely. The driving power being then applied, the drum D, will revolve and wind the fustian round it, which, as it passes along, will be operated upon by the knives, and as many of the cords cut open lengthwise as there are knives applied. The rotating speed of the drum, when drawing the fustian forward under the knife, should be about nine turns per minute.

A certain number of the cords having been thus cut from end to end of the piece, the cylinder D, is then thrown out of gear with the driving machinery, and the cylinder *c*, put into gear for the purpose of drawing the fustian back again, and winding it on to the roller C, as before. The points of the knives are then inserted into another series of cords, and on the fustian being again advanced, those cords will be cut open in the same way. . Thus, by successive operations, all the cords in the entire width of the fustian will have been cut open, and the piece made ready for the future processes of dressing and finishing.

On the axle of each drum C, D, there is a toothed wheel *f*, *f*, which turns loosely upon the axle, but may be locked thereto by a clutch *g*.

A longitudinal shaft H, is mounted in suitable bearings by the side of the machine, to the end of which shaft is attached the fast and loose driving pulleys *i*, and *j*. Upon this longitudinal shaft two worms or endless screws *h*, *h*, are affixed, which respectively take into the teeth of the loose wheels *f*, *f*, on the axles of the drums C, and D; and, consequently, when the shaft H, is made to revolve, the wheels *f*, *f*, are turned also; and whichever of the wheels is locked to the axle of the drum C, D, that drum will necessarily be made to rotate, and to wind the piece of fustian round it, as before described.

In order to lock either of the wheels *f*, *f*, to the axle of the cylinder C, or D, levers *k*, and *l*, are mounted upon fulcrum pins in brackets, extending from the further side of the framework, seen in fig. 2; one end of each lever being connected to the sliding clutch *g*, and the other end of each lever attached to a sliding bar *m*, *m*, extending transversely through the machine. By the workmen applying his hand to the end of the bar *m*, of the machine in front, and pushing the bar inward, the levers *k*, and *l*, will be moved, and cause one of the clutches *g*, to lock the toothed wheel *f*, to the axle of the drum D, and withdraw the other clutch from the wheel on the axle of the drum C, which sets the drum free. By these means the fustian will be advanced through the machine, and drawn from the cylinder C, on to the cylinder D, and the knives be made to cut the cords or ribs open, as described. When it is desired to stop the machine, the bar *m*, is drawn back to a certain point, which places the clutches in the midway, not locking the wheels to either of the drums; but when it is required to bring the piece of fustian back again from the drum D, on to the drum C, the bar *m*, must be drawn further out, which will cause the clutch to lock the wheel *f*, to the axle of the drum C, and give it a retrograde movement.

As the delivering cylinder, whichever it may be, is thus allowed to turn freely, it is necessary to apply a friction brake, to keep the piece of fustian tightly distended between the two drums. For this purpose a plain wheel I, I, is fixed upon the axle of each drum, and circular friction straps K, K, are mounted, so as to embrace each wheel. These circular friction straps are made to open, each with a hinge joint, and are drawn tight, that is, collapse round the wheels by means of weighted levers *n*, *o*: straps are attached to these levers whenever passed over pulleys, and are connected to the sliding rod *m*, so that as the rod *m*, is slidden inward for advancing the cloth, the lever *n*, is allowed to descend, and the circular strap is drawn tight round the friction wheel of the loose cylinder C, and the lever *o*, being raised, the strap is released from the first wheel of the cylinder D. When the rod *m*, is drawn outwards, the reverse takes place, that is, the wheel of the drum D, is pressed by its friction strap, and the other is relieved.

The handle and sliding bar *p*, connected to the lever *q*, shifts the driving band to and from the fast and loose pulleys. They are held in the driving position by a lever *r*, dropped into a notch in the bar *p*; and when this lever is raised, a weighted cord *s*, attached to the bar *p*, and passed over a pulley, as shown in the end view, fig. 3, draws the bar back, and causes the driving strap to be shifted on to the loose pulley.

An auxiliary lever *t*, having a handle in front of the machine, is connected to the sliding bar *m*, by which the workman may instantly change the position of the clutch boxes.

As the fustian passes forward through the machine under the knives, if the point of one of the knives happens to penetrate through the fustian, the knife necessarily falls upon a transverse bar L, L, beneath the fustian. The bar L, is affixed to the ends of arms or levers M, M, extending from a shaft or axle N, N, which is mounted on standards in the side frames of the machine, the bar L, and arms M, being balanced by weights on the opposite side of the shaft N, so as to enable the bar L, to be supported by very delicate spring catches in standard pieces O, O, affixed to the sides of the framework. This contrivance is best seen in the transverse section of that portion of the machine represented at fig. 6. In this figure, L, represents the edge of the bars O, O, the standard pieces affixed to the side rails A, A, of the machine; *u*, *u*, are small hooks at the ends of the bars L, bearing upon, and held up by, the delicate spring catches *v*, *v*, attached to the standard pieces.

When one of the knives, on penetrating through the fustian, falls upon this bar L, its weight forces the bar down from its support in the spring catches, when the teeth of a small ratchet wheel P, which has been kept revolving upon a stud by a pulley and cord, connected with a pulley on the axle of the roller F, strikes against this fallen bar with such force, as to cause a tail lever Q, on the shaft N, to knock up the holding lever *r*, before described, and thereby allow the driving strap to pass to the loose pulley, when the movements of the machine instantly cease.

If any obstruction, like a knot in the cord of the fustian, should come against the point of any one of the knives in operation, as the fustian is conducted forward, the resistance will force the knife back, and its spring holder G, giving way, will cause the hinder part of the socket *d*, to strike against a transverse bar R; and this bar, being connected by arms to an axle S, mounted on the standards *w*, the receding of this bar R, will cause an arm to lift a tail lever, extending from the back of the shaft N, of the balanced bar L, (see fig. 5,) by lifting which, the tail piece *z*, will be made to raise the holding lever *r*, and thereby cause the driving strap to be shifted, as before, from the fast to the loose pulley.

In the event of the point of any one of the knives jumping up out of the cord which it was cutting, the force of the spring holder G, would project the knives forward, and cause it to fall out of its socket *d*, when the weight of the knife handle, as it falls, striking upon a transverse rod T, supported by arms U, U, from a strap V, will cause the arm W, to force back the lever X, extending from the axle N, and thereby to raise the tail piece *z*, will raise the holding lever *r*, and shift the driving strap as before.—[*Inrolled in the Rolls Chapel Office, May*, 1835.]

Specification drawn by Messrs. Newton and Berry.

To Robert Burton Cooper, *of Battersea-fields, in the county of Surrey, Esq., and* George Frederick Eckstein, *of Holborn, in the county of Middlesex, ironmonger, for their invention of an instrument or apparatus for pointing pencils, and certain other purposes.*—[Sealed 12th October, 1833.]

This invention consists in placing two files, or other rough surfaces, at an angle to each other, so as to form what the Patentees call a "concave longitudinal file," for the purpose of pointing slate or black lead pencils, crayons, holders for hair pencils, and pen-holders made of ivory, mother of pearl, ebony, cedar, or other hard wood, and other such like articles. The instrument may be constructed separately, or let into and fixed in any situation required, such as in the frame of a slate for pointing slate pencils, or a lady's work box for sharpening stilettos, &c. When formed separately, the files are placed at any required angle, and fixed by cement, or any other convenient means, into frames made of wood, tortoiseshell, metal, or any other substance. This is the most simple and most economical manner of manufacturing the instrument. The Patentees propose another mode of making the instrument, which is by fixing two cylinders, roughened in a similar manner to a file, in a wooden or other frame, and capable of turning on an axis; which cylinders, when they are placed in contact with each other, will form an angle convenient for the purposes for which this instrument is intended, and may be shifted round to bring a fresh part into operation as the instrument wears.

The Patentees proceed to state the manner in which their invention is intended to be used, which is by gently rubbing the pencil, crayon, or other article intended to be sharpened, backwards and forwards between the two files, keeping the point down in the angle formed by the junction of the two rough surfaces, and closely in contact with both of them; a very slight degree of pressure being necessary to cause the files to remove or cut away the wood.

The Patentees state, in conclusion, that they do not mean or intend to claim for their invention files having alternate spaces between them, in a similar manner to knife sharpeners, as it is obvious that such a mode of construction would not answer the purposes for which their invention is intended to be used; nor do they intend to confine themselves to any particular materials to make the file of, as it is obvious that the same effect may be produced by various other rough surfaces, such as sand, glass, or emery paper, but that they prefer the files to be made of steel; and, finally, they claim as their invention the construction of "a continuous concave longitudinal file," for the purpose of sharpening slate or black lead pencils, crayons, and such like articles, as before mentioned.—[*Inrolled in the Inrolment Office, April,* 1834.]

To JOHN BATE, *of the Poultry, in the city of London, optician, for his having invented an improvement or improvements on machinery, applicable to the imitation of medals, sculpture, and other works of art executed in relief.*—[Sealed 9th April, 1834.]

THE object of this invention is to produce facings, engravings, or correct representations of busts, medallions, medals, seals, or other objects in relief, on a plain surface, in a more correct and perfect manner than has hitherto been done by tracing or engraving machines; and is particularly designed to prevent the distortion of the features of the bust, or of the subject to be copied, at the same time producing the desired effect, to represent a subject in relief. Fig. 7, Plate II., represents a side elevation of these improvements on machinery applicable to the imitation of medals, sculpture, and other works of art executed in relief: A, A, represents a fragment of a board or table; and B, shows a vertical section of a brass socket fixed thereto; C, is a square brass standard, made to slide up and down within the socket, being very accurately fitted; D, is a steel screw, having a micrometer attached at its lower end, by which means it can be turned so as to move the standard C, at equal distances, either ascending or descending; E, shows a plate of metal fixed to the standard C, and inclined to the horizontal plane of the table or board A, A, at an angle of forty-five degrees. The upper edge of this plate has a groove formed in it, to receive two bevelled rollers of a carriage now to be described: F, represents a carriage, which moves very freely on the plate E, by means of three rollers, two of which are bevelled, so as to enter the groove formed to receive them, or the upper edge of the plate E. In this view, only one of the bevelled rollers *a*, can be seen, the other being immediately behind it. These rollers are made with long axes, and very accurately fitted in their bearings, so as to move freely without shaking. The lower part of this carriage is supported, and moves on a single roller *b*, the axis of which is placed at right angles to those already described, the periphery revolving and resting upon the ledge *c*; *d*, *d*, represents a sliding plate, which is made very true, and parallel on two of its edges; and these are bevelled on each side, so as to produce a double prism; the bevelled edges so formed enter the grooves of four rollers, fixed in the carriage F; two of these rollers are seen near *e*, *e*, the other two, being placed immediately behind, cannot be seen in this figure.

By these means the sliding plate *d*, *d*, is made to move very freely, and yet with great accuracy; *f*, represents a point, fixed to the sliding plate *d*, *d*; this is used to trace over any medal, or other suitable work of art that is required to be copied: G, shows a section of a portion of a sphere, rising from a planed surface, and similar to a medal in its general form. Any such subject may be fixed to the supporting frame H, by any suitable cement, care being taken that its plane be placed in a proper position: I, is a metal guide, fixed at its lower end to the sliding plate *d*, *d*; the upper portion of this is formed into a straight edge at *g*, and stands perpendicular to A, A: K, represents a vibrating lever, the arms of which are equal; this swings freely on two conical points, one of which is seen in the arm L, fixed upon the carriage F. The upper end of the vibrating lever has a friction roller *h*, placed in it, which is always kept in contact with the straight edge of the guide *g*, by the spring *i*, while the lower end of the lever moves the frame M, at the end of which the diamond point is fixed, as shown at *j*, perpendicular to the surface of the copper plate N, which lies parallel with A, A.

The left-hand end of the point frame M, is jointed on each side to the lower end of the vibrating lever K, forming an elbow joint therewith, the pivots or bearings being made conical, so as to avoid friction as much as possible: *p*, represents a small barrel, fixed on an axis, one end of which turns in the end of the arm *q*, and is retained in any position by friction; the other end has a flat button formed on it, by which it may be turned: *r*, shows a small silk cord; one end of this is coiled round the barrel *p*, and the other is attached to the point frame M.

By these means the diamond point may be raised from the plate, and kept suspended at pleasure: O, represents a metal plate fixed to the bracket P, which is firmly attached to the inclined plate E. There are two such brackets; one is supposed to be removed, to show the parts that would otherwise be hidden: Q, represents the plate carriage, which has three friction rollers placed in frames under it. Two of these rollers are bevelled, and run in a groove formed in the plate O: the other roller is plain, and rolls on the surface of the same metal plate: *k*, is a steel chain, one end attached to the arm R, and the other at *l*, to a stud projecting from the under side of the plate carriage Q; *m*, shows a cord made fast at one end to the stud near *l*, and passing over the pulley *n*, it hangs down, and has the weight O, appended to it; by which means the carriage will be drawn along in the direction of the dart whenever C, is lowered by the micrometer screw D.

When this machine is to be used, the micrometer screw D, should be placed in the centre of its range, as shown at D, in fig. 7; and then the medal, or other object to be traced over, must be placed at such a height, that the tracing point *f*, may be brought just in contact with the centre of the medal or other object, when the sliding plate *d*, *d*, is placed in the centre of the limits or range that it has to move in between the rollers that confine it: the centre of the copper plate N, must at the same time be placed immediately under the diamond point, with its edges parallel to the plate

Q. The machine and plate being thus adjusted, the micrometer screw D, must be made to raise the standard C, and all the parts combined therewith, until the tracing point *f*, will nearly reach the top of the medal or other subject G, at *s*. The tracing point *f*, must then be laid hold of by the hand, and brought into contact with the surface at *s*, (moving the screw D, as may be required, to bring the tracing plate *d, d*, into its mean position,) by means of the combined motions of *d*, *d*, and F. The machine will then be in the proper position for beginning the first line, when the button *t*, must be turned, and the diamond point gently let down upon the copper plate; and the tracing point *f*, being then passed very carefully over that part of the medal which presents itself to it, the diamond point will be found to have etched a line on the copper plate, exactly corresponding to the undulations which the tracing point has passed over on the medal. The diamond point must then be raised from the plate, and the micrometer screw must be turned, so as to produce such a space between the lines on the copper plate as may have been previously determined upon, and the same movements repeated, until the whole surface of the medal has been traced over. When sculpture or other works of art are to be traced over, and the undulations of the tracer transmitted to a plate, so as to produce a copy thereof, such works must be placed before the tracer *f*, in a vertical position; and the mode of setting and adjusting the machine, and also the copper plate, must be adopted, as before described; and then if the tracer *f*, be made to pass over every part that the tracing point will reach, such undulation will be transmitted to the copper plate, and a correct representation will be the result.

In some works that are executed in very high relief, it would be quite impossible to reach many parts that are in deep recesses with a point of the ordinary conical form; but for such purposes the Patentee has invented the following instrument, which he calls a tracing blade. Fig. 8, represents a side elevation of a tracing blade, combined with the tracing plate; a fragment of which is shown upon a larger scale at *d*, *d*: *u*, *u*, represents the edge of the blade, which is exactly in a line with the axis *v*; this axis is placed in a socket, where it turns freely, but without shaking; being secured therein by a screw and washer at the upper end; T, is a weight or counterpoise, that serves to balance the weight of the blade, which, it may be seen, terminates in a point. When parts that lay in deep recesses are to be traced, the point of this blade must be used for that purpose, the edge *u*, *u*, being always brought in contact with those parts that are elevated; and when the edge of the blade is in its passage sufficiently raised upon any projecting part, so as to give the point thereof a fair bearing, then the blade should be gradually turned round as the point advances, so as to make it descend on the opposite side of the projecting part, in the same relative position as it assumed when it was raised. In descending into any recess to trace the undulations of deep-seated projections, the edge of the blade will be found of great use in directing the point to such parts; and it should be observed, that whenever the point of the blade has terminated its operation of tracing on the surface of any projection, and begins to descend into any recess, that instant the diamond point should be lifted, and kept suspended until the point of the blade comes in contact with any other part of the surface over which it is to pass, and then the diamond should be immediately let down upon the copper plate, by which means the series of lines that produce the representation will be continued. Fig. 9, represents a front view of fig. 7, the same letters of reference being placed upon the same parts wherever they can be seen. In this figure the standard C, is omitted, and also the micrometer screw by which it is moved. In former constructions, the tracing point is moved in a plane perpendicular to the plane of the medal. Now, in the improved construction, the tracing point moves in a plane oblique to the plane of the medal, or, in other words, oblique to the plane in which C, moves; and the principle of the correction consists in making the line described upon the copper (which is straight, so long as the tracer describes the plane of the medal, and becomes diverted from the straight line, as the tracer rises above this plane), be diverted an equal quantity from the straight line upon the copper, as the tracer is diverted from a plane perpendicular to the plane of the medal. The relative direction of the motions required to produce this effect may be described by any right-angled triangle; one motion being in the plane of the base, a second in the plane of the perpendicular, and a third in the plane of the hypothenuse, or in planes parallel to these several planes respectively; and the proportion of apparent elevation in the engraving will be to the elevation in the medal itself, as the proportion of the base of the triangle to its perpendicular.

In the triangles A, B, C, fig. 12, the motion represented by A, B, is effected in the machine by the edge *g*; that represented by A, C, is effected by the sliding plate *d*, *d*; and the motion represented by B, C, is given in the plane surface N; also in fig. 10, where the base and perpendicular are equal, the engraving will appear as much elevated as in the medal itself: in fig. 12, where the base is half the perpendicular, the engraving will appear to have only half the elevation of the medal; and in fig. 12, where the base is double the perpendicular, the engraving will appear to have double the elevation of the medal; E, representing the medal to be traced; F, the plane of the medal; and the triangles A, B, C, and *m*, *n*, *o*, being similar.

The Patentee concludes by saying, "I hereby declare, that whether the machinery or apparatus, shown in fig. 7, at D, and C, that is used to shift the tracing point equal distances, moves either vertically, horizontally, or in any other direction, my invention consists in making the tracing point move and operate upon the medal, or other work of art, in a plane oblique to such motion, that being the principle wherein my invention differs from all other machinery now used for producing similar effects. I also claim as my invention, the sole use of a tracing blade of the description shown in the drawing, fig. 2, by the use of which, when applied in the way I have described, sculpture or other works of art, executed in high relief, may be more advantageously traced-over than could be effected by any other instrument now in use for such a purpose."—[*Inrolled in the Petty Bag Office, October,* 1832.]

SCIENTIFIC NOTICES AND NOVEL INVENTIONS.

SOUTH AMERICA.

Canal through the Isthmus of Darien. The City of Panama, situate 9° N. Lat., 79° 30″ W. Lon., on the north side of the extensive bay of Panama, is likely to become of great importance as a commercial entrepôt. A canal was projected many years ago for the purpose of establishing a communication between the Atlantic and Pacific Oceans, by cutting it through the narrowest part of the Isthmus. This great project is now in progress, and promises to open an extensive intercourse between the opposite sides of the South American Continent, and also a more direct passage from Europe to China across the Atlantic. The original project was suspended for many years, and subsequently an iron railway was contemplated; but the numerous difficulties which the face of the country presented to the plan occasioned its relinquishment. The canal now executing is nearly completed, with its several locks, upon a line of about sixty miles, and will carry craft drawing five feet of water. The local government objected to the cut being upon the scale originally projected, which would have admitted the direct sailing of ships of two to three hundred tons from one ocean to the other, from a jealousy that the great maritime powers would, in the course of time, claim the free passage of the Isthmus without paying the state tolls. The actual canal is, of course, upon a comparatively small scale, and its scite and arrangements under the more immediate control of the Government. The cargoes of ships from the Atlantic side must unload at Porto Bello, situate on the Spanish main, upon the Isthmus nearly due north of Panama. The vessels from Lima, Truxillo, and other places upon the Pacific line of coast, must discharge their freight at Panama. Thus a new direction will be given to a large portion of the Indian and American trade, by the facilities offered by this new line of communication.

BEJUCO BRIDGES.

The art of bridge-building has in modern times attained the rank of a science, from the application of mathematical principles to every portion of their construction. In this science our English architects are probably pre-eminent. The immense span of the arches, and the united beauty and solidity of our stone bridges, constitute them unrivalled specimens in this department of art; whilst the introduction of iron bridges and suspended chain piers, forms an entire new epoch in progress of human invention. Yet amidst these splendid improvements, it may not be uninteresting to notice the humble, but not less useful, suspension bridges constructed by the South American Indians, which enable them to pass over dreadful chasms, and rapid rivers exceeding one hundred feet in breadth, with safety, affording them the means of opening communications, and of carrying on traffic, in mountainous districts, which would scarcely be traversed but by these means. The bejuco plant is the cordage of nature; so extremely flexible in its fibres, that no bending or twisting can break them; so durable, that cables and hawsers made of them are found, by experience, to last in sea-water almost equally with our best hempen cordage. The bejuco grows abundantly in Peru, and in other parts of the South American Continent; it is a species of ivy, running up and supporting itself upon their lofty trees; and descending again, it forms new shoots and plants, propagating themselves in like manner. The most slender of these cords are about a quarter of an inch in diameter, the stronger about half an inch; above this size, they become hard and brittle, consequently unfit for the purposes of cordage. Of these natural ropes, the South Americans form large cables of the length required for the intended suspension bridge, which are hauled across the river or chasm, and are strongly fixed to stout trees, or prepared timber work, on the opposite sides. Four cables form the ribs of a platform, and two the rails for safety. Across the ribs a reticulation is formed of smaller bejuco cords, the meshes of which are interwoven with strong Indian reeds, and the whole is framed with sufficient solidity for the purpose of traffic. The Indians, loaded with their baggage and merchandise, pass over these bridges with safety and unconcern: to the Europeans their passage appears a formidable matter, especially when the wind is high, as there is then a great vibration in the fabric. This suspension bridge is general throughout many districts, and serves as a high road to facilitate intercourse between them; but the Americans have a bejuco bridge of a more simple construction, for the purpose of slinging themselves and their mules over smaller rivers and chasms. This bridge consists of a single cable of bejuco twist, fastened on one side to a strong post, on the other to a wheel, which slackens or tightens the rope, as it may be required; if for mules, two cables are stretched in like manner, one for each side of the river or chasm. A clue or loop of wood runs on each cable; by this the beast is suspended by means of girths, and is rapidly slung to the opposite side. Thus the American Indian accommodates his means to his wants: the continued extension of European arts may in time substitute iron bridges for the bejuco suspension bridge of the American.

MINES OF POTOSI.

The mountain of Potosi, which contains these celebrated mines, is situated in Peru, S. Lat. 20°, W. Lon.

67°, they have been worked nearly three centuries. The rich veins of silver ore were originally near the surface; now some of the shafts are above two hundred fathoms deep: notwithstanding their great depth, they are not incommoded with water, and the aids of the steam-engine are not required. The mines of Hungary supplied European commerce with the precious metals for many centuries previous to the discovery of America; but the immense supplies continually drawn from the outset fron the new continent, have gradually and materially affected the relative value of these metals in comparison with the other objects of commerce.

The discovery of the silver mines of Potosi was accidental. An Indian, named Gualca, pursuing some wild goats up the mountain, caught the branches of a shrub in order to assist his ascent, the shrub yielded to his weight, and came up by the roots; the Indian discovered a mass of fine silver, besides lumps attached to the clods about the roots of the shrub. Gualca enriched himself by repeated journeys to the mountain, until confiding the secret to his friend, who afterwards quarrelled with him—the treasure became known to the Spaniards, who possessed themselves of it; and in the course of two hundred years, sacrificed some millions of Indians in the prosecution of the works: prodigious numbers continue to be destroyed every year up to this period, from the excessive quantity of poisonous exhalations arising from these mines. The gold mines of Peru are worked at nearly an equal cost of human life. Few who calculate the hoards of metropolitan banks, or delight in the splendid display of a modern goldsmith's shop-window, contemplate the sacrifice of humanity and of moral feelings by which they are furnished. The pining Indian of Potosi, and the pallid Hungarian slave at Schemnitz, corroded to their vitals by metallic vapours, form dark shades to the accumulated gold and silver of our brilliant establishments.

FRANCE—PLATE-GLASS.

The casting of plate-glass has, since the first discovery of the invention, been an important branch of French manufacture. The invention is owing to Abraham Thevart, who, in the year 1688, introduced it to the notice of the French administration, and received due encouragement. Under their protection and assistance, the manufactory at the Castle of St. Gobin, three leagues from Laon, was established. This is the most extensive plate-glass foundry in France; it has gradually increased in its number of furnaces, fages, and appendages, until it now presents the appearance of a town, rather than a manufactory. A plate has been lately cast here of the extraordinary dimensions of 15 feet by 12 feet, for the Château des Thuilleries. The use of plate-glass is infinitely more extended in the principal cities of the Continent than with us, owing, principally, to the impolitic and heavy duties to which our Government has hitherto subjected this article of commerce. The late reduction of the duty to one-third of its previous amount, will enlarge the use of this splendid addition to our elegant conveniences. British plates are now equal in quality to the best French specimens, but they are more subject to a degree of undulation, which distorts the appearance of objects: this defect is probably owing to the mass not being continued in a sufficient state of fusion, during the progress of the operation of casting.

SILK MANUFACTURE.

This branch of French industry was nearly ruined at its principal establishment, when the National Assembly ordered the total destruction of the city of Lyons. Since the rebuilding of the city, during the government of Buonaparte, the manufacture has been gradually increasing; but it has not yet attained the extent which it formerly boasted. Two principal causes give a general superiority to French silks above British, —the greater elegance in the designs of their patterns, and the superior lustre of their surface; the first advantage is indigenous to the French—their artists are undoubtedly far beyond ours, in the beauty and composition of their ornament designs, in almost every branch of the elegant arts; the second advantage was originally owing to an accidental discovery of the mode of giving that high degree of lustre to their taffeties, which rendered them more sought after than ours were, and which process has been transferred to other branches of the manufacture.

The discovery was made by Octavio Mai, a manufacturer of Lyons, who had failed in his business. One day, musing upon his misfortunes, he continued to chew some raw silk he happened to put into his mouth, till his reverie was over. Upon spitting out the silk, he observed that it had attained, during the process of mastication, an extraordinary degree of glossy lustre. He traced the causes to the pressure used, and the united action of warm glutinous saliva. He applied these observations to the process of the taffety manufacture, and constructed a loom with rollers, which pressed the taffeties prepared with a glutinous liquid, and kept in a due temperature over charcoal fires; and thus produced a degree of lustre, which gave a preference to this manufacture. M. Mai's composition for giving high gloss to black silks, consisted of beer and orange-juice, boiled to a due consistency—for coloured taffeties, he used distilled gourd-water with gum arabic. He acquired a very large fortune by this happy discovery: the same process is continued by the French manufacturers, and is one cause of the preference given to their productions.

COMPARATIVE STRENGTH OF WINES.

	Proportion of alcohol (s. g. 0.825) per cwt. by measure.		
Madeira, common	25.77	to	26.18
Ditto, various old specimens	18.96		
London particular	22,10		
Bucellas	18.10		
Brown sherry	18.03		
Port	21.98	to	22.87
Sauterne	13.00		
Claret (Margeaux)	11.04	to	11.10
American wine, two years old	11.25		
Ales, American	7.38	to	10.67
Cyders	4.41	to	4.84
Whiskey, Irish	73.70		
Gin, genuine "Hollands"	55.54		
Brandy, common	51.01		
Whiskey, common	42.95		
Spirits of Wine	93.27	to	95.35

—*Researches on Wines, &c., by L. G. Beck.*—*American Journal of Science.*

HOT BLAST.

Dr. Clark stated that in Mr. Neilson's process for smelting iron by the hot blast, one ton of iron is now produced by two ton fourteen cwt. of coal, instead of eight tons one-and-a-half cwt.

formerly required—thus causing a saving of five tons eight cwt. —three hundred per cent.—*Ibid.*

NEW METHOD OF PRODUCING HEAT.

By projecting upon a fire a mixture of water and oily matters in a certain proportion, a flame is produced, whose heat is extremely intense. If the water be in excess, the flame languishes, or if in too small a quantity, a smoke is produced. For one measure of tar, it is requisite to employ about one and a half of water: 15lbs. of oil of turpentine mixed with 15lbs of water, and projected upon 25lbs of Newcastle coal, produced as much heat as 120lbs of this coal.—Ann. des Mines, tom. v., p. 278. —*Ibid.*

GAS LIGHTS FROM ROSIN.

From the report of M. Pouillett, upon the results obtained by MM. Boscavy and Darne, in the manufacture of illuminating gas from rosin, it appears that the illuminating power of gas from rosin is about double of that from oil, and that five cubic feet of gas from rosin, gave as much light as nine of oil gas.—Soc. d'Encour. pour l'Industrie Nationale, 1834.—*Ibid.*

New Patents
SEALED IN ENGLAND,
1835.

To Henry Bernard Chaussenot, of Leicester-square, in the county of Middlesex, civil engineer, for his invention of an improved construction of the lamps or apparatus used for burning gas, for producing a better combustion of the gas.—Sealed 28th July—6 months for inrolment.

To Spole Rosenborgh Anderson, of Cornhill, in the city of London, Esq., for his invention of improvements in hand and power-looms.—Sealed 28th July—6 months for inrolment.

To Robert and Alfred Charlton, of Manchester, in the county of Lancaster, calenderers and finishers, for their invention of certain improvements in the machinery used for stiffening and finishing woven manufactured goods.—Sealed 28th July—6 months for inrolment.

To William Crofts, of New Radford, in the county of Nottingham, machine-maker, for his invention of certain improvements in certain machinery for making figured or ornamental bobbin-net, or which is commonly called ornamental bobbin-net-lace, and which improvements are in part in extension of part of the improvements for which letters patent were granted to him on the 23rd day of December, 1834.—Sealed 30th July—6 months for inrolment.

To William Mason, of Brecknock-terrace, Camden Town, in the county of Middlesex, engineer, for his invention of improvements in the manufacture of fire-arms and artillery.—Sealed 6th August—6 months for inrolment.

To William Mason, of Brecknock-terrace, Camden Town, in the county of Middlesex, engineer, for his invention of improvements in the manufacture of steam-engine cylinders, pistons, bearing pumps, and cocks.—Sealed 6th August—6 months for inrolment.

To Samuel Faulkner, of Manchester, in the county palatine of Lancaster, cotton-spinner, for his invention of an improvement in the construction of a machine for carding cotton and other fibrous substances.—Sealed 6th August—2 months for inrolment.

To John Cooper Douglas, of Great Ormond-street, in the county of Middlesex, Esq., for his invention of certain improvements in ventilating subterraneous and other places, and in constructing an apparatus or apparatusses, in which combustion is carried on; and also in applying certain fluids to various useful purposes, and in constructing an apparatus or vessel for the appropriation of such fluids.—Sealed 10th August—6 months for inrolment.

To Edward Jones, of Birmingham, in the county of Warwick, builder and brick-maker, for his invention of certain improvements in machinery for moulding bricks, tiles, and other articles made of brick earth.—Sealed 10th August—6 months for inrolment.

To Samuel Wilson Nichol, of Elham, near Canterbury, in the county of Kent, gentleman, for his invention of certain improvements in rendering condensing steam-engines portable and applicable as a means of general transport on a rail and other roads.—Sealed 10th August—6 months for inrolment.

To Luke Hebert, of Paternoster-row, in the city of London, civil engineer, for his invention of certain improvements in flour-mills.—Sealed 10th August—6 months for inrolment.

To William Evatt Wright, of Regent-street, in the city of Westminster, gentleman, for his invention of an improved box for holding coals.—Sealed 12th August—6 months for inrolment.

To John Day, of York-terrace, Peckham, in the county of Surrey, gentleman, for his invention of an improved wheel for carriages of different descriptions.—Sealed 14th August—6 months for inrolment.

To Richard Sheppard, of Newport Pagnell, in the county of Buckingham, carpenter and builder, for his invention of improvements in tiles for covering roofs.—Sealed 17th August—2 months for inrolment.

To Thomas Rock Shute, of Watford, in the county of Hertford, silk throwster, for his invention of improvements in spinning and doubling organzine silk.—Sealed 17th August—6 months for inrolment.

To Frederick Bowman, of Great Alie-street, in the county of Middlesex, sugar-refiner, for an improvement in the process of renewing the virtues of animal charcoal, when exhausted or improved, being a communication from a foreigner residing abroad.—Sealed 17th August—6 months for inrolment.

To Henry Phillips, of Excter, chemist, for his invention of certain improvements in purifying gas for the purpose of illumination.—Sealed 17th August—6 months for inrolment.

To William Banks, of Springhill-terrace, near Birmingham, in the county of Warwick, manufacturer, for his invention of a certain improvement in machinery pens and presses for ruling and pressing paper.—Sealed 17th August—2 months for inrolment.

To Henry Pinkus, late of Pennsylvania, in the United States of America, but now of 76, Oxford-street, in the county of Middlesex, gentleman, for his invention of improvements in inland transit; which improvements are applicable to, and may be combined with, an improved method of or combination of method and apparatus for communicating and transmitting or extending motive power, by means whereof carriages or waggons may be propelled on railways or roads, and vessels may be propelled on canals, for which improved methods &c., letters patents were granted to the said Henry Pinkus, dated the 1st day of March, 1834.—Sealed 17th August—6 months for inrolment.

To Elijah Galloway, of Wellington-terrace, Waterloo-road, in the county of Surrey, for his invention of certain improvements in paddle-wheels for propelling vessels.—Sealed 18th August—6 months for inrolment.

To William Johnson, of the Horsley Iron-works, in the parish of Tipton, in the county of Stafford, gentleman, for his invention of a certain improvement or certain improvements in the construction of boots and shoes.—Sealed 22nd August—6 months for inrolment.

To William Lucy, of Birmingham, in the county of Warwick, miller, for his invention of certain improvements in steam-engines.—Sealed 24th August—6 months for inrolment.

To Theodor Schwartz, technologist, formerly of Stockholm, but now of Bradford-street, Birmingham, in the county of Warwick, for his invention of a practical application or practical applications of known principles to produce mechanical power.—Sealed 24th August—6 months for inrolment.

To Charles Appleby, of Sheffield, in the county of York, merchant, for his invention of certain improvements in manufacturing files.—Sealed 25th August—6 months for inrolment.

To John Lane Higgins, of Oxford-street, in the county of Middlesex, Esq., for his invention of certain improvements in the construction of and in working vessels for navigation.—Sealed 26th August—6 months for inrolment.

HALLEY'S COMET.

Rome, Aug. 6.

(From the Observatory of the Collegio Romano.)

Yesterday, at about half-past seven, Roman time, Halley's Comet was seen from our observatory, at that part of the heavens which we have calculated according to Damoiseau. Its light-was very faint, much resembling that of Biela's Comet. It is near the star Zeta, in Taurus. The approach of the morning, and the clouds which overcast the sky, hardly allowed us time to determine its place with accuracy. Its right ascension we found to be 5 deg. 26 min., and its north declension 22 deg. 17 min.—*Allgemeine Zeitung*.

To the Editor of the Times.

Sir,—During the past week, when the feeble moonlight justified attempts at finding Halley's Comet, I met not any thing deserving notice till just now, when, having cautiously examined that portion of the heavens between 4 hours 50 minutes and 6 hours 30 minutes of right ascension, and 30 and 24 degrees north declination, I found in the field of the telescope, at 1 hour 11 minutes, sidereal time, a round, well-defined nebulous body, hitherto undiscovered, extremely faint, and perhaps about two minutes of space in diameter. Its place, as far as the miserable mounting of the object-glass would allow me to determine, was—right ascension 5 hours, 42 minutes, and 31 seconds, and its declination 23 degrees 43 minutes, north.

An instrument thus directed will show the observer three stars of the ninth magnitude, nearly equi-distant, in the same line, lying in the south-following quadrant, and inclined to the parallel at some 50 or 70 degrees. Calling the southernmost of the stars A, the central one B, and the northernmost C, nearly preceding the star B, as much as the latter is distant from A, or C, will be detected a minute star of the 12th or 14th magnitude, with which, and B, C, the nebuloid formed nearly a parallelogram, the side composed of it, and D, being a little longer than B, C.

The sky, shortly after I found it, became hazy, and even cloudy; so that occasionally only could I regain a glimpse of it. Micrometical comparisons with other stars were impracticable; whilst, to the disgrace of the art of astronomical instrument-making in England in the 19th century, all attempts to determine by direct observation, whether it is an hitherto undiscovered nebula, or Halley's comet, were vain.

The apparent motion of the comet is so trifling—the interval between its getting out of the vapours of the horizon, and becoming lost in the twilight, so short—the weather so capricious—the climate so unfavourable—the object sought after so interesting—and the recollection that an observer of no mean note, having first regarded the large nebula of Andromeda, subsequently announced another nebula, which had been known to astronomers nearly half a century, as Encke's comet, of his finding, will, I trust, authorise me to request a publication of this notice in your journal, and to put observers on their guard, lest they be gulled by, and lose their time on, a nebula which lies very handy, whose right ascension is about 5 hours 24 minutes, declination 21 degrees 54 minutes—and which is No. 1 of Messier.

I remain, Sir, your obedient servant,
James South.

Observatory, Kensington, Sunday morning, 4 o'clock.

P.S.—To such of your readers as may have no equatorially mounted telescope, it may be well to state, that the suspected body follows the star 132 Tauri, which will be found at about three minutes and a half of time, and is about 47 minutes south of it.

Since the above was at press, we have received the following from Sir James South, dated Monday morning, 4 a. m.:—

"The nebuloid body *is* Halley's Comet. At 23 hours, 55 minutes, and 47 seconds, sideral time, this morning, its right ascension was about five hours, 43 minutes, and 18 seconds; while its northern declination was 23 degrees, 49 minutes, and 43 seconds."—*Standard.*

CELESTIAL PHENOMENA, FOR SEPTEMBER, 1835.

D.	H.	M.	
1			Clock before the ☉ 0m. 1s.
	—		☽ rises 3h. 51m. A.
	—		☽ passes the mer. 7 h. 27 m. A.
	—		☽ sets 11 h. 1 m. A.
3	14	7	♃'s first sat. will im.
4			Occul. 33 Capri, im. 10h. 50m.
	—		Occul. 35 Capri, im. 12h. 2m.
5			Clock after the ☉ 1m. 15s.
	—		☽ rises 6 h. 40 m. A.
	—		☽ passes the mer. 11h. 13m. A.
	—		☽ sets 2 h. 36 m. M.
	7	24	♅ in conj. with the ☽ diff. of dec. 4. 28. N.
7	2	51	Ecliptic oppo. or ○ full moon.
10			Clock after the ☉ 2 m. 56 s.
	—		☽ rises 7h. 56m. A.
	—		☽ passes the mer. 2h. 10m. M.
	—		☽ sets 9 h. 54 m. M.
	16	0	♃'s first sat. will im.
12	21		☽ in Apogee.
15			Clock after the ☉ 4 m. 41 s.
	—		☽ rises 9 h. 59 m. A.
	—		☽ passes the mer. 5h. 54 m. M.
	—		☽ sets 2h. 36m. A.
	3	44	☽ in □ or last quarter.
16	8	37	♃ in conj. with the ☽ diff. of dec. 3. 27. S.
	—		Occul. A Gemi, im. 15 h. 44 m., em. 16 h. 40 m.
17			Mer. R. A. 12 h. 28 m. dec. 2. 50. S.
	—		Ven. R. A. 11 h. 22 m. dec. 5. 35. N.
	—		Mars R. A. 13 h. 18 m. dec. 8. 1. S.
	—		Vesta R. A. 9 h. 35 m. dec. 16. 45. N.
	—		Juno R. A. 6 h. 1 m. dec. 10. 13. N.
	—		Pallas R. A. 16 h. 57 m. dec. 11. 27. N.
	—		Ceres R. A. 17 h. 8 m. dec. 26. 20. S.
	—		Jup. R. A. 6 h. 54 m. dec. 22. 43. N.
	—		Sat. R. A. 13 h. 25 m. dec. 6. 31. S.
17			Georg. R. A. 22 h. 0 m. dec. 13. 3. S.
	—		☿ passes the mer. 0 h. 46 m.
	—		♀ passes the mer. 23 h. 40 m.
	—		♂ passes the mer. 1 h. 35 m.
	—		♃ passes the mer. 19 h. 9 m.
18	13	28	♀ greatest Hel. Lat. N.
19	0	48	☿ descending node.
	12	22	♃'s first sat. will im.
	—		Occul. η Leonis, im. 16h. 7m.
20			Clock after the ☉ 6m. 26s.
	—		☽ rises 2 h. 24 m. M.
	—		☽ passes the mer. 10h. 15m. M.
	—		☽ sets 5h. 48m. A.
	21	41	♂ in conj. with ♄ diff. of dec. 2. 16. S.
21	17	47	♀ in conj. with the ☽ diff. of dec. 3. 34. S.
22	2	26	Ecliptic conj. or ● new moon.
	12	32	♃'s third sat. will em.
23	6	31	☿ in conj. with the ☽ diff. of dec. 4. 28. S.
		49	☉ enters Libra, Autumn commences.
	17	40	♄ in conj. with the ☽ diff. of dec. 0. 57. S.
	20	50	♂ in conj. with the ☽ diff. of dec. 3. 6. S.
24	16		☽ in Perigee.
	14	26	♃'s second sat. will im.
25			Clock after the ☉ 8 m. 10 s.
	—		☽ rises 9h. 27 m. M.
	—		☽ passes the mer. 2 h. 28 m. A.
	—		☽ sets 7 h. 16 m. A.
26	14	15	♃'s first sat. will im.
27			Occul. χ Oph., im. 6h. 57m., em. 8h. 1m.
28	5	6	☿ in conj. with ♄ diff. of dec. 3. 39. S.
29	4	10	☿ in Aphelion.
	7	8	☽ in □ or first quarter.
	13	22	♃'s third sat. will im.
	16	32	♃'s third sat. will em.

J. LEWTHWAITE, Rotherhithe.

METEOROLOGICAL JOURNAL,

FOR JULY AND AUGUST, 1835.

1835.	Thermo.		Barometer.		Rain in inches.	1835.	Thermo.		Barometer.		Rain in inches.
	Hig.	Low.	High.	Low.			Hig.	Low.	High.	Low.	
July						Aug.					
26	79	58	30,11	Staty.		10	83	48	30,25	30,20	
27	84	51	30,05	30,02		11	85	52	30,08	29,94	
28	85	50	30,08	30,02		12	81	55	29,94	29,88	
29	82	52	30,13	Staty.		13	74	54	30,08	30,02	
30	84	50	30,11	30,04		14	72	48	30,14	30,13	
31	74	51	30,06	Staty.		15	77	41	30,12	30,09	
Aug.						16	76	57	30,11	30,09	
1	84	45	30,07	30,00		17	76	59	30,19	30,18	
2	75	49	29,95	29,93		18	76	53	30,22	30,18	
3	71	53	29,99	29,95		19	79	52	30,13	30,07	
4	76	43	29,96	29,95		20	80	55	29,94	29,77	
5	78	44	29,97	Staty.		21	80	53	29,63	29,55	
6	76	58	29,97	29,96	,0125	22	77	58	29,61	29,55	
7	70	60	29,94	29,91	,025	23	73	52	29,72	29,68	
8	72	47	30,22	30,17		24	73	58	29,68	29,53	
9	76	44	30,28	Staty.		25	69	48	29,59	29,53	

Edmonton. **CHARLES HENRY ADAMS.**

Latitude 51° 37 32 N.
Longitude 3 51 West of Greenwich.

THE

London

JOURNAL AND REPERTORY

OF

Arts, Sciences, and Manufactures.

CONJOINED SERIES.

No. XLIII.

Recent Patents.

To JOHN GEORGE BODMER, *of Bolton-le-Moors, in the county of Lancaster, civil engineer, for his invention of certain improvements in the construction of grates, stoves, and furnaces, applicable to steam-engines, and many useful purposes.*—[Sealed 24th May, 1834.]

THIS invention of improvements in the construction of grates, stoves, and furnaces, applicable to steam-engines, and other useful purposes, consists in certain novel constructions and arrangements of the parts of such grates, stoves, furnaces, or fire-places; by means of which constructions or arrangements the fuel is gradually conducted through the furnace, and the cinders, clinkers, or unconsumed fuel, ultimately discharged.

These novel constructions or arrangements have for their object a more equal, regular, and constant supply of fuel to the fire, and also a more perfect combustion of the coal.

As the improvements are applicable to various descriptions of furnaces for different purposes, we have here shown, in the accompanying drawings, several applications of the same, in order that the invention may be better understood, although the Patentee does not mean or intend to confine himself to the precise form or dimensions therein shown, as, under different circumstances, they will require to be varied to suit the nature of their application.

In Plate III., three different novel arrangements or constructions of grates, stoves, or furnaces, for effecting the above objects, are particularly shown.

The first plan, on which it is proposed to construct the grates of furnaces, is exhibited in Plate III., at figs. 1, and 2. In this instance, the grate that supports the fuel in a state of combustion consists of a series of circular bars formed as a hollow cylinder or drum, mounted on an axle which turns in bearings. This cylindrical grating is made to revolve upon its axis by means of gearing connected with it, and driven by any first mover.

The coal, or other fuel, is introduced into the furnace by a curved passage, from whence it proceeds on to a clear and unoccupied part of the upper surface of the cylindrical grate; and as the grate revolves, the fuel is carried forward, and becomes ignited by its contact with the fuel previously in a state of combustion; and when the fuel has passed slowly through the whole extent of the furnace, its cinders, clinkers, and other refuse parts, can be removed from time to time, as required.

Fig. 1, is a vertical section, taken lengthwise through part of the boiler, and its fire-place or furnace showing the feeding channel and the rotatory drum grate, with the gearing for giving it motion, and also the clearing grate, with the parts or apparatus by which the refuse fuel is removed when desired: A, A, is the boiler of the common construction, employed for low-pressure engines; B, B, B, the brick-work, in which the boiler is set, forming also the sides of the fire-place, flues, and ash pit; C, is the feeding channel for the passage of the coals, or other fuel, on to the circular fire-bars D, D, D, the bars being connected together so as to form a cylinder or drum-shaped grate, the upper surface of which drum constitutes the bottom of the fire-place E, and upon this the combustion of the fuel takes place; F, is the clearing grate, formed by a frame with straight fire-bars, upon which the ashes, cinders, clinkers, or unconsumed fuel, is delivered, as the cylindrical grate revolves, and from whence it can be removed, as occasion may require. The feeding channel C, is of a curved form, extending the whole width of the series of fire-bars, or cylindrical grate, and is made of sheet iron, to facilitate the descent of the fuel. It may be furnished with a hopper, to introduce the fuel, and a door to close the top, if desired.

The cylindrical grate is constructed in the following manner; but the Patentee does not intend to confine himself precisely to the mode described, as a similar sort of cylindrical grate may, perhaps with equal advantage, be constructed in several other ways: *a, a,* is an axle or shaft, mounted upon and turning freely in bearings or plummer boxes, fixed on brackets, projecting from the side walls of the ash pit. Upon this axle are fixed two, three, or more wheels, or sets of radial arms, with circular rims *b, b, b, b*. To these rims are attached, by bolts and rebate blocks, the T-shaped bars *c, c, c, c*, placed longitudinally in the direction of the axle. The T-shaped longitudinal bars *c, c, c*, support the ends of the series of segments *d, d, d, d*, constituting the fire-bars, one of which is shown detached, as it would appear in a side and end view at fig. 2.

The segment bars are notched at their ends, as shown at *e, e, e*, fig. 2, for the purpose of fitting on to the T-shaped edges of the rails *e*, as shown in fig. 1. The ends of the fire-bars are made wider than the other parts, in order to keep the bars at proper distances apart, when combined to form the grate; that is, leaving openings between the bars for the discharge of dust, and the admission of air, to support combustion. When the longitudinal bars *c*, have been fixed on to the rebates of the arms or rims *b*, the segment bars are severally introduced, their notches *e, e*, at both ends fitting on to the flanges of the T-shaped longitudinal bars; the segment bars are then slidden along the longitudinal bars; and when the proper number to form the cylindrical grate have been thus placed, the whole are secured in their situations by keys or wedges, driven into slots on the ends of the bars *c*, thereby forming, when put together, a complete hollow drum or cylindrical grating, composed of circular bars, and capable of receiving rotatory motion, which I propose to effect in the following manner:—

To one end of the cylindrical grate or drum is attached a toothed rim or wheel G, which gears into a pinion H, (shown by dots in fig. 1). This pinion turns upon a stud, fixed to the iron bracket, supported by the side brick-work, and to which pinion is attached a toothed wheel I, which takes into another pinion K, on the end of an axle turning in bearings, supported also by brackets from the brick-work. This axle has attached to its reverse end the fast and loose pulleys or riggers L, having a strap or band M, passed over them, which receives motion from the engine or other first mover.

By these means, a slow continuous rotatory motion is communicated through the train of wheels and pinions, to the drum or cylindrical grate, in the direction of the arrow in fig. 1, by which the surface of the fire-bars, in contact with the ignited fuel, is continually changing; and the coal, or other material for combustion, progressively carried forward from the lower end of the feeding channel through the furnace, towards the clearing grate; and which, in its progress, becomes ignited, and, for the most part, consumed.

By these means a quantity of heated fuel, cinders, clinkers, and ashes, will be accumulated upon the clearing grate F, which may be allowed to remain there while the combustion continues; and when it is desirable to remove the refuse ashes, cinders, and clinkers, that can be done by the following means:—The clearing grate F, is suspended by pins or short axles, turning in bearings *g*; and it is kept up in its position by the rods extending from each end of the clearing grate, one of which rods is shown in fig. 1, at *h*, connected by joints to ears at the under part; the lower ends of these rods are brought nearly together, at the middle of the furnace, in order to form bearings for the axle of the roller *i*; this roller runs upon the inclined plane rail *k*, placed at the bottom of the ash pit; *l*, is a rod, jointed to the fore part of *h*, *h*, at one end, and the other end is formed into a loop or handle, which is passed over a hook *m*, fixed in the floor of the ash pit. On raising the looped end of the rod *l*, from the hook *m*, and pushing the rod back, the roller *i*, will pass down the inclined plane *k*, the clearing grate will fall into the position shown by dots, when the ashes, cinders, clinkers, &c. will descend into the pit. By again bringing the rod *l*, forward, and passing the end over the hook *m*, the grate will be brought up to its proper position, as before.

The second modification of improvements in the construction of grates or furnaces, which the Patentee denominates the propelling or travelling grate, to distinguish it from the foregoing rotary grate; this is exhibited in the several figures 3, 4, 5, 6, 7. In this construction of grate or furnace, the fire-bars are framed in sets or separate portions, each frame of bars being furnished with small wheels or rollers, which are made to travel upon horizontal rails or ledges, along the fireplace or furnace, under the boiler, from the front to the back. The frames of consecutive grates or bars receive their charges of fuel as they pass under the feeding channel; and in travelling along the furnace, the fuel upon the grates becomes ignited, and nearly consumed.

When the grates or frames of bars respectively arrive at the further end of the furnace, they are cleared from their cinders, clinkers, ashes, and unconsumed fuel, by passing under a bridge of fire-bricks, which acts as a scraper; and having proceeded beyond the extremity of the furnace, each frame or grate is brought on to a weighted lever trap, from whence, by the falling of the trap, they severally descend on to an inclined plane, formed by a railway, placed in the ash pit below. Upon this inclined plane railway, the grates are, by their own gravity, made to return to the front part of the furnace, and to pass on to a lifting stage. By means of this lifting stage, and the machinery connected therewith, the grates are severally raised up into a situation where they will stand ready to be passed through the furnace, as before, on the line of horizontal rails first described.

From this situation, the frame of grating, which has just been raised, is propelled onward upon the horizontal railway, under the feeding channel, driving the whole line of grates through the furnace, as before described.

By these means, the fuel is spread evenly over the whole surface of the fire-bars, and the grates are made to travel progressively through the furnace, and thereby produce a more uniform and regular heat than has been heretofore effected by any other contrivance; and the fire-bars are, by their change of situation, greatly protected from the destructive effects of a partial intensity of heat, which commonly occurs in ordinary constructions of furnaces.

Fig. 3, is a vertical section, taken lengthwise through the boiler, fire-place, flues, brick-work, and ash pit, the travelling grates forming the bottom of the furnace being also shown in section upon the horizontal rails.

Fig. 4, is a vertical section taken crosswise through the boiler, furnace, flues, and brick-work near the back end, part of the machinery being seen which is there situate, viz. the weighted lever trap.

The same letters of reference are used to denote similar parts in the several figures: A, is the boiler; B, the brick-work; C, feeding channel; D, D, D, the several frames of fire-bars or grates, one of which is shown detached in horizontal and front views at fig. 5; E, E, is the furnace; F, the drop lever or trap for lowering the frames of grating, in order that they may return to the front part of the ash pit. The horizontal railway G, G, is formed by two parallel bars set edgewise, and fixed on to brackets projecting from the side walls of the ash pit: H, H, is the inclined plane railway, similarly formed and supported, and descending toward the front of the ash pit; I, is the lifting stage for raising the grates severally from the lower, or inclined plane, to the upper or horizontal railway. Let it be supposed that one of the frames of grating has been returned upon the inclined plane H, and raised into the situation of that at D*, fig. 3; the lifting stage I, will then be coincident with the horizontal railway G, and the frame D*, with the other frames D, D, D, placed before it in a consecutive range.

The propelling machinery may now be brought into operation by the following means: *a*, is a strap or band passed from the engine, or other first mover, to the fast and loose pulleys *b*, *b*¹, turning upon an axle formed by a stud projecting from the standard K.

To the working pulley *b*¹, is attached the pinion *c*, which gears into the wheel *d*, fixed on the end of the shaft *e*: this shaft has a swivel bearing at one end, and passes through a slot in the standards. On the other end of the shaft *e*, is mounted the pinion *f*, which takes into the pins or teeth of what is called a mangle wheel *g*, fixed on the horizontal shaft *h*. This shaft also turns in bearings in the side standards. On the shaft *h*, is fixed a disc on each side of the grate, one of which is shown at *i*; each of these discs having a toothed segment *k*, on its periphery, the teeth of which take into the horizontal racks *l*, *l*. These racks, on both sides of the railway, are connected together by the cross bars or braces, which thereby constitute a carriage; and this carriage is furnished with wheels, for the purpose of enabling it to move along the auxiliary rails or brackets *n*, projecting in front of the ash pit, and supported from the brick-work. When the pinion *f*, works outside of the pins or teeth of the mangle wheel *g*, that wheel will be made to revolve in the direction of the arrow in fig. 3, where a portion only of this wheel is shown, in connexion with the pinion, it being broken, to expose the disc and the segment of teeth behind.

On the end or tappet *o*, of the teethed segments coming against the projecting studs or teeth *p*, *p*, of the horizontal racks, (as shown in fig. 3,) the carriage *l*, will be made to move inwards; and as the segments proceed in their rotary movement, their teeth will be brought into gear with those of the racks, and the cross bar or brace *m*, will come in contact with the frame or grate D*.

By the rotation of the segments, as indicated by the arrow, the rack carriage *l*, will be advanced, and the whole line of grates D, D, D, be propelled; that is, made to travel onwards upon the railway G, the grate D*, being thus made to take the place of the one before it; and in passing under the feeding channel C, it will receive its supply of fuel. At the time that each grate or frame of fire-bars is raised from the inclined railway H, into the position shown at D*, in the front, the grate situate at D**, at the back end of the furnace, will have been passed on to the drop lever or trap F, which is mounted on an axle, turning in bearings, fixed to the side walls of the ash pit.

This drop lever or trap is kept in its horizontal position by a counterbalance weight *q*, suspended from an arm attached to the back part of the lever; but when the grate D**, comes on to the trap, its weight would overbalance, and cause the trap to drop down into the position shown by dotted lines in fig. 3, were it not for a catch or holdfast *r*, which confines the tail piece *s*, and retains the trap or drop lever in its horizontal position.

This catch is, however, released, and the grate allowed to run down on to the inclined plane railway at the proper time, as will be described hereafter. As soon as the rack carriage *l*, in front has pushed the grate D*, off the stage I, and advanced it a sufficient distance into the furnace, the opening or termination of the circle of teeth or pins in the mangle wheel *g*, will have arrived opposite to the pinion *f*, when the pinion will drop through the opening, and immediately work in the inside of the teeth or pins of the mangle wheel, and consequently cause it to revolve in the opposite direction to the arrow in fig. 3; by which means the rack carriage will be returned into its former position, as shown at *l*.

At the inside of each of the discs *i*, *i*, there is a tappet *t*, formed at one end of a semicircular rim *u*, which will be best seen by reference to the detached fig. 6, where one of the discs is shown in three different positions; the tappet *t*, is intended to raise the stage I, and the semicircular rim *u*, to keep it elevated.

Fig. 7, represents the stage I, detached, showing one of its sliding arms *w*, with the piece *v*, at top. As the discs *i*, *i*, go round, the tappets *t*, work under the pieces *v*, *v*, of the sliding arms *w*, *w*, and lift the stage I, with the empty grate, until the peripheries of the semicircular rims *u*, *u*, come into operation, which hold up the stage I, and the empty grate, in the elevated situation, shown in fig. 3, during the time that the rack carriage *l*, is propelling the grates forward under the feeding channel, and through the furnace, by the means above described.

On the retrograde movement of the discs *i, i,* caused by the pinion *f,* acting at the inner part of the mangle wheel, the circular rim *u,* slides back under the piece *v,* still supporting the stage I; but when the tappet *t,* comes into operation under the piece *v,* as the discs *i,* revolve, the stage is allowed to descend until it arrives in the lower situation, shown by dots, that is, in a line coincident with the end of the inclined rails H; and as it descends to that position, the cross bar of the stage L, comes into contact with the bent lever *x,* and by depressing that lever will effect the liberation of the drop F, in the following manner:—The bent lever *x,* turns on a fulcrum pin fixed in the brick-work, and its shorter arm is by a joint connected to the rod *y,* which rod is attached at the reverse end to the tail of the catch lever *r,* (also turning on a pin projecting from the wall); and when the curved end of the lever *x,* is depressed by the descent of the stage I, the catch *r,* will be disengaged from the arm S, of the trap F, and the weight of the empty grate will cause the trap to drop into the position shown by dots in fig. 3, and the grate D**, to be launched on to the inclined plane rails H. The empty grate will now, by its own gravity, travel along the inclined plane rails H, and pass on to the stage I, (then in the situation shown by dots,) and will be stopped by the cross bar *z,* of the standard. As soon as the grate has left the trap lever F, the trap will be again brought into the horizontal position by the counterbalance weight *q*. After the grate has arrived upon the stage I, the pinion *f,* changes gearing from the inside of the teeth of the mangle wheel *g,* on to the outside, when the wheel *g,* the discs *i, i,* with their rims *u, u,* and toothed segments *k, k,* will again move in the direction of the arrow; by which means the tappets *t*, *t*, will again raise the stage in the manner before described, bringing the empty grate into a line with the horizontal rails G, that is, in the position shown in fig. 5, ready to be again propelled into the furnace when required. On the lifting stage ascending, the lever *x*, will rise, and the catch *r*, at the reverse end of the rod *y*, will then confine the trap as before.

When it is desired to remove any ashes, cinders, clinkers, &c., from the back end of the fire-place, the last grate or frame of the fire-bars, as at D**, may be drawn on to the trap F, by means of a hook: the cinders, clinkers, &c., accumulated at the end of the furnace, will then fall into the ash pit; and should it be found necessary at any time to rake or stir the fire, that can be done through the opening at M. The fire may be lighted through this opening, or from underneath, by drawing one or two of the grates apart. Should it be found desirable to regulate the draft through the fire, by impeding the admission of air between the grate-bars, plates may be placed as dampers across the ash pit at N, or in any other required situation: these plates rest upon brackets, bolted or rivetted to the horizontal rails, and can be shifted when desired. And if it should be found desirable, a line of fire-brick may be placed between the top of the frames of fire-bars and the under side of the boiler.

It is obvious that a propelling or travelling grate may be constructed by a series of fire-bars, attached to an endless chain, passed over conducting rollers, and actuated in any convenient manner; or the frames of fire-bars or grates, above described, may be connected by hooks or latches, one to the other, and be drawn through the furnace, instead of being propelled in the manner above described, which the Patentee has not thought it necessary to describe, as they may be varied and modified in many ways.

The third plan on which it is proposed to construct improved grates for furnaces, is exhibited in fig. 8, and which is called the *vibratory grate.* In this construction of furnaces, the grates or fire-bars have a vibratory motion communicated to them, for the purpose of moving the coal on the bars, and causing the furnace to supply itself with fuel; it also allows of the ashes, clinkers, &c. being removed.

Fig. 8, is a vertical section, taken longitudinally through the boiler and furnace: A, is the boiler; B, the brick-work, which encloses the furnace and ash pit; C, the feeding channel, by which the fuel is conducted into the furnace; D, D, the fire-bars or grates, placed in a rectangular frame E, supported by four upright rods or rocking levers *a, a, a, a.* These upright rods are connected by joints, at their upper ends, to the frame E, by pins or bolts, passed through ears or lugs at the under part of the frame; the lower ends of the upright rods are jointed in a similar way to the bottom of the ash pit: F, is a horizontal shaft, turning in bearings on brackets, projecting from a plate fixed to the front of the brick-work. This shaft F, has two arms or levers *b, b,* extending from it, the ends of which levers have anti-friction rollers, acted upon by the tappets *c, c, c,* on a lower horizontal shaft G, revolving in bearings, as the former. Horizontal rods *d, d,* connect the levers *b,* with the grate frame E, by joints at their ends. A weight *e,* is suspended from an arm, attached to the middle of the shaft F. The action of this grate is as follows:—A slow rotatory motion being communicated, in any convenient manner, to the shaft G, so as to cause it to turn in the direction of the arrow, the tappets *c, c, c,* will be made successively to act against the rollers at the ends of the arms *b*: by which means, the arms *b*, will, by the action of each tappet, be forced inwards, and thereby cause the connecting rods *d,* to move the frame E, a short distance inward upon the rocking levers *a, a, a, a,* the grate carrying the coal with it; but as soon as the tappets respectively pass from under the rollers of the arms or levers *b*, those arms and the rods *d,* frame E, and grates D, will be brought back with a sudden jerk by the force of the weight *e,* the friction rollers stopping against the next tappet.

By these means, a constant vibratory movement of the grate is kept up, and the fuel is gradually conducted down the fire-bars; but the inclination given to the grate is not sufficient to cause the fuel to slide down by its own gravity, it therefore only advances when the weight jerks the grate back into its quiescent position; the fire-bars, by that means, sliding back from under the fuel, which is kept from returning with the grate, partly by its own weight, and partly by the resistance of the coal at the end of the feeding channel.

When it may be requisite to remove the ashes, cinders, clinkers, or other refuse material from this furnace, the person attending the engine and fire pulls the levers or arms *b, b,* outward, or in the direction of the dotted arrow, at a time when the position of the tappets *c, c,* will allow the friction roller at the ends of the arms *b*, to pass; he will then be enabled to draw the grate, with its frame, away upon its rocking levers *a, a, a, a,* from the bridge H, at the end of the fire-place, and thereby allow the ashes or clinkers to drop through the opening into the ash pit. When this has been done, the grate may be again replaced, by bringing the arms *b, b,* into their previous position upon the tappets *c, c.*

Fig. 9, is a vertical section, showing one arrangement for adapting the rotatory drum-grate to the ordinary brewer's copper, or distiller's alembic: A, is the boiler; B, the brick-work; C, the feeding channel; D, the fire-bars or revolving grate; E, the fire-place; F, the flues; G, the clearing grate, which, in this instance, is furnished with small rollers or wheels, supporting it upon the rails H. To the clearing grate is connected, at one end of the lever I, having a fixed pin as its fulcrum; the other end is connected to the rod K, having a handle formed on its end, which is passed over a hook in the floor. By means of this rod *k*, the clearing grate can be opened, to allow of the discharge of the ashes or clinkers, and afterwards closed by the same means.

Fig. 10, is a sectional view, showing the adaptation of the cylindrical grate to a puddling furnace: A, is the arch of the fire-place; B, the brick-work; C, the feeding channel; D, the cylindrical grate; E, the fire-place; F, the bridge; G, the clearing grate, the bars of which should, in this instance, be made of wrought iron, to withstand the high degree of temperature required; H, are the flues leading to the furnace.

The Patentee then proceeds to say, that "having now particularly described the arrangements of three different novel constructions of grates for furnaces, I would first remark, that as there is not any fire-door in the front part of these grates, cold air is prevented getting into the interior of the furnace above the ignited fuel, all the cold air to support combustion passing through the openings between the fire-bars from below. And further, that there never is any fresh fuel at any time thrown upon the already ignited coal; for after the fire has been once lighted, the fresh fuel continues to ignite, from being in contact with that already burning, and not on the top of it, as in common. And further, that the smoke, arising from the fresh fuel while igniting, will be obliged to pass over the whole surface of that already in a red hot state, and consequently will be subjected to the flame and heat arising therefrom, by which means the smoke will be completely consumed. These points I consider essential to the perfect combustion of fuel, and preventing, in a great measure, the emission of smoke from the chimney.

"I would also remark, that the strap which communicates the motion to these grates may be connected by any suitable arrangement of apparatus or machinery to the steam gauge of the boiler; and as the steam rises beyond the required degree of temperature, the gauge may be made to throw off the strap from the working pulley when the motion of the fire-bars will be stopped, and as the steam lowers in temperature, the gauge descending allows the strap to be again passed over the working pulley, when the grate will resume its motion as before. This I prefer to be adapted in the propelling or travelling grate, as it will cause the fire to be supplied with fuel only at the times required. And I would further remark, that hot air may be conducted to these grates from pipes placed in the chimney (or other situation, as is usually done), to assist in the consumption of the smoke."

The Patentee further remarks, that from the fire being kept so regular in his novel constructions of grates or furnaces, and from the circumstance of there not being any fresh fuel thrown upon that already ignited, he is enabled to place the surfaces of steam generators much nearer to the ignited fuel than in furnaces of the common construction, without the danger of their being burned from the coal or ignited fuel surrounding them, or from unequal firing.

In fig. 8, I have shown applied to the furnace a construction of generator which may be adapted to these grates with advantage, and enlarged portions of the same at fig 11: I, I, are two water chambers placed on each side of the fire-place, and connected together by copper pipes J, J, J, and braced together by rods and screw nuts and plates: K, K, are pipes communicating with different parts of the boiler, by which the steam generated in the tubes is conducted to it, and a supply of water kept up therein. When this generator is put together, these tubes J, are passed through openings in the outside of the water chambers I, I, and the holes are covered by the plates of the screw nuts, as shown in the enlarged fig. 11.

It may be remarked, that as these furnaces have not any opening or door in the front of the fire-places, there would be a difficulty in lighting the fire; but this may easily be done by passing some already ignited coal through the opening in the back of the fire-place, or it might be lighted through the clearing grate with shavings, or a door may be made in the side of the brickwork opposite the clearing grate of the rotatory cylindrical grate; but as the fire in furnaces of steam-boilers should not be extinguished but when required for repairs, I prefer the first trouble in the lighting without it.

The specification contains several drawings and adaptations of these improvements to hot-air stoves and steam generators, but we have not thought it necessary to describe them fully here, as their applicability will be sufficiently obvious from the foregoing description.—[*Inrolled in the Rolls Chapel Office, November*, 1834.]

Specification drawn by Messrs. Newton and Berry.

To Joseph Gibbs, *of Kennington, in the county of Surrey, engineer, for his invention of certain improvements in carriages, and in wheels for carriages.*—[Sealed 3d November, 1834.]

This invention consists in a peculiar arrangement of the spokes and naves of wheels for carriages, by which improvements the Patentee states that greater facility is offered in the manufacture of the said wheels. The Patentee sets forth the peculiar arrangement of the spokes to consist in placing them at an angle to each other, so that when viewed edgeways, as in the figure, the spokes may form the sides of an isosceles triangle; the nave representing the base, one end of the spokes being placed equidistantly in the felloes of the wheels, and the other end being inserted alternately in the two ends of the nave, which also constitutes the axle-tree box. The ends of spokes may be formed in such a manner, as just to fit in and wedge one another tightly, when they come against the axle-tree box, or longitudinal grooves may be cut or cast on the outer surface of the axle-tree box.

Fig. 12, represents a section of one of the improved wheels: *a, a,* are the spokes; *b, b,* the felloes; *c,* the axle-tree; and *d,* the axle-tree box or nave of the wheel; *e, e,* are bolts, which hold the different parts of the wheel together, and also keep the axle-tree in the box; *f,* and *g,* are plates, against which the ends of the spokes abut, the spokes bearing against the plate *f,* and the spoke *a**, bearing against the plate *g.* These plates are kept in their places by the bolts *e, e,* before mentioned. The axle-tree is kept in its place by the following means: a collar *h,* is formed on the axle-tree, which, when the axle-tree is put in the box, abuts against the end of the nave; and another plate *i,* which is behind the collar *h,* into which the bolts *e, e,* are screwed, and keeps the wheel together, and prevents the axle-tree from coming out or shaking.

Fig. 13, represents a section of another arrangement of the spokes, in which the spokes *a, a,* are placed in the same plane, and kept in their proper places by plates *f,* and *g,* fastened together by screw bolts *e, e,* as in the former figure. If the spokes are arranged in such a manner as to form a smaller cone at the inner than at the outer end of the box *j,* it will be evident that, by screwing the bolts *e, e,* the cone *j,* will be forced through the hole formed by the spokes, and consequently push all of them outwards towards the felloes, and thus an expanding action outwards will be produced.

The Patentee proceeds to state, that having now described the different parts of the wheel constructed, according to his improvements, he considers it necessary to point out more particularly the peculiar novelty and advantage in the construction of the wheel.

It is evident, that if, in case of the spokes getting loose, the plates *f,* and *g,* are screwed more tightly together, the spokes, forming, at present, an isosceles triangle, will be made to approach nearer towards the perpendicular, and thus force the felloes outwards, and expand the circumference of the wheel, and consequently make the wheel most rigidly secure.

The Patentee further remarks, that a wheel constructed according to his improvements, may be repaired in a much shorter time, and with greater facility and economy, than wheels of the ordinary construction; for in case of one of the spokes getting injured or broken, it is only necessary to loosen the plate *f*, or *g*, by unscrewing the bolts *e*, *e*, sufficiently to remove the injured spoke; and when repaired, to place the same in its place, and screw up the plates again, and the wheel will be again complete.

Having thus described the invention of certain improvements in wheels for carriages, and the manner of using the same, the Patentee would have it understood that he does not mean or intend to claim any of the various parts of the wheel separately, most of them being well known; but he confines his claim to the arrangement of the spokes in such a manner, that they may be capable of expanding the felloes, and thereby offering greater facilities in constructing and repairing wheels formed in this manner over the ordinary wheel.

The second part of this invention for improvements upon wheel-carriages, consists in the application of a spiral spring and barrel, as a substitute for the ordinary springs for carriages. Fig. 14, represents such parts of a carriage as are necessary to explain this part of the invention, with the spiral spring and barrel attached thereto; one of the ends of the barrel being removed to show the interior, which contains a spring *a*, the action and construction of which is similar to the action of a watch spring, one end being fastened to the axis *b*, and the other to the box or barrel *c*: a strap *d*, is wound round the periphery of the barrel *c*, one end being fastened to the barrel at *e*, and the other end is attached at *f*, to the supporting arm *g*, which arm is bolted or fastened to any convenient part of the carriage *h*. It will now be evident, that if any weight be added to the carriage, it will cause the body of the carriage to be depressed, thereby pulling round the strap *d*, and consequently causing the barrel *c*, to turn on its axis *b*; and thus the spiral spring *a*, will be partially wound up. It should be observed, that, in the application of this invention, two such barrels, with springs, ought to be used, thereby causing the motion of the carriage nearly to correspond with that of a carriage with common springs. It will be evident, however, to all practical men, that some apparatus is necessary, to prevent the carriage from rising and falling in an improper direction, and also to prevent the axle from turning round. To obviate this inconvenience, the Patentee fastens one end of the flat bar of iron or steel *i*, to the axle-tree, and the other end to a knuckle-joint *j*. By this means, when the carriage vibrates, or is depressed by any weight, the bar of iron or steel *i*, will be made to describe a segment of a circle, shown by dots in the figure; the knuckle-joint *j*, representing the centre of the circle.

The Patentee concludes by saying, that having now described the nature of his invention of improvements in carriages, and the manner in which the same is used, he hereby declares that he claims as his invention the application of a spiral spring and barrel, as a substitute for the ordinary spring of carriages, and also the mode of connecting the axle to the body of the carriage, namely, by the bars *i*; and though the parts separately may before have been used in different descriptions of machinery, yet the Patentee claims the whole as a combination, thereby forming an improved substitute for common carriage springs.—[*Inrolled in the Inrolment Office, May,* 1835.]

To Richard Hill, *of Birmingham, in the county of Warwick, gentleman, for an improvement in door and other locks, and in staples used therewith.*—[Sealed 18th March, 1835.]

These improvements in door and other locks, and in staples, consist, first, in a peculiar construction of locks, suited for street doors, or chamber doors, in which one bolt is made to answer as a sliding catch bolt, as a key bolt, as a thumb or shoot bolt, or as a drawback bolt, instead of the several bolts employed in ordinary locks for those purposes; and, secondly, in adapting to the edge of the staple, which receives the bolt of a catch lock, a roller to relieve the friction.

The several figures in the accompanying Plate represent the improved construction of locks in different positions.

Fig. 1, Plate IV., is a front or external view of the lock. Fig. 2, is an edge view of the same. Fig. 3, represents the interior of the lock, as seen at the back, in the reverse position to fig. 1: *a, a, a,* is the box or case of the lock; *b, b,* is the bolt, sliding within staples *c, c.* A tumbler *d,* shown by dots, hangs upon a pivot, fixed into the plate of the lock behind the bolt, and which tumbler is pressed downwards by a spring *e.* The wards of the lock are shown at *f.* Figs. 4, 5, 6, and 7, are sections taken vertically through the lock case or box *a, a,* in the position of fig. 1; that is to say, the face plate of the lock is in these four last-mentioned figures removed, for the purpose of showing the internal mechanism; the same letters referring to similar parts of the lock in all the figures. The handle for throwing back the bolt is shown at *h*, which handle operates exactly as in an ordinary catch lock, its shaft fitting into the square hole of the follow or piece *i*. This follow, when turned, forces back the lever *k*, which has a hook at its upper part; but a spring *l*, keeps this lever erect, when it is not acted upon by the follow. A lever *m*, hanging upon a fulcrum pin, near its extremity, fixed into the side of the bolt, is connected by its forked or crooked end to another lever *n*, turning upon a fulcrum pin, passed through its centre, also fixed into the bolt, both of which are confined by a bridle piece *p*. In this last-mentioned lever, near its extremity, a pin or stud *o*, is inserted, and the hooked end *r*, of the lever *k*, is intended to take hold of this stud; so that when the follow *i*, is turned, as in fig. 5, the bolt *b*, must be drawn back by the receding of the lever *k*, the lever *m*, being pressed by a spring *q*, and made to hold the lever *n*, firmly in the proper position. Fig. 8, shows the bolt removed from the lock, with the levers *m*, and *n*, attached to it, and also the bridle piece *p*. When it is desired to lock the door by a key, that is, to project the bolt, as in fig. 7, the key *u*, must be introduced into the lock, and turned round, as represented at fig. 6; in which situation the key will raise the lever *m*, and cause the lever *n*, to be moved also into the positions shown at fig. 6. The pin or stud *o*, in the end of the lever *n*, will, by this movement of the levers, be drawn down, free from the hooked end *r*, of the upright lever *k*; and the tumbler *d*, at the back of the lock, being, at the same time, raised, as shown by dots in fig. 6; and its stud lifted above the notches on the upper edge of the bolt; the key *u*, will, by bearing against the side of a piece *s*, in the under side of the bolt, cause the bolt to be projected, as at fig. 7, when the parts will immediately assume the positions there represented.

When the bolt is required to be withdrawn, as in unlocking the door, the key being again introduced, and turned in the opposite direction to that last described, the levers *m*, and *n*, and the tumbler *d*, will be raised as before, and the stud *o*, brought opposite to the opening of the hook *r*, in the upright lever *k*, the key *u*, then pressing against the opposite side of the piece *s*, the bolt will be slidden half back, as at fig. 6, the stud *o*, passing into the hook *r*, of the lever *k*; and if the key is turned further, the bolt will be forced completely back into the lock case, as at fig. 5, and the door allowed to open. A stop *t*, is fixed in the lock plate, to prevent the lever *k*, falling too far back.

For the purpose of fixing the bolt, either in its locked or half-locked position, a bent lever *w*, is fixed to the stem of a thumb knob *x*; the end of which lever will, on turning the thumb knob, pass into one of the notches *y*, or *z*, at the under side of the bolt, and prevent the bolt being drawn back, either by the handle *h*, or key *u*. This bent lever *w*, therefore, acts as a thumb bolt and as a safety bolt.

Fig. 9, shows another modification of the same principles of construction, by means of which, one bolt may be made to answer the purposes of a catch or drawback bolt, a key bolt, and a thumb bolt. Its construction is rather simpler than the lock described above, as the lever *n*, is, in this arrangement, dispensed with, and the lever *m*, carries the stud *o*; but the corresponding parts are marked with the same letters, as before; and, therefore, a detailed description of this figure would be a repetition of the foregoing, and is unnecessary.

Fig. 10, represents a front and end view of my improved staple for a catch lock, in which a roller *a*, turns upon a vertical shaft or axle; and when the inclined edge of the bolt strikes it on closing the door, the friction is relieved by the roller turning round.

Having now described the improvements in the construction of locks for doors and other places where security is required, the Patentee further remarks, that if it should be thought desirable, the tumbler *m*, may be made to answer the purposes of the locking tumbler *d*, by placing a projecting stud on its side, acting in notches, formed in the front plate of the lock, the back tumbler being, in that case, dispensed with.

In conclusion, the Patentee further observes, that although he has described in this, his specification, many of the ordinary parts of the lock which are not new, and have been before used in locks of the common construction, yet he does not mean or intend to claim them separately; but he does claim as his invention, the construction and arrangement of a lock, however the forms and positions of its parts may be varied from the figures which have been given to explain his principle, wherein one bolt is made to perform all the different offices of the three bolts of the ordinary street door lock, chamber door lock, and that description of lock called a draw-back door lock, with the effect of the slide thumb bolt, which improved lock may be acted upon at pleasure, either by the handle, the key, or the thumb-piece, however formed and adapted in one single lock. —[*Inrolled in the Rolls Chapel Office, September*, 1835.]

Specification drawn by Messrs. Newton and Berry.

To THOMAS WESTRUPP *and* WILLIAM GUBBINS, *both of Bromley, in the county of Middlesex, gentlemen, for their invention of improvements in converting salt, or other water, into pure or fresh water.*—[Sealed 24th May, 1831.]

THIS invention of certain improvements consists in a combination of apparatus, applied to the common ship's hearth, which, the Patentee states, will procure a constant condensation of steam from salt, or other impure water, without requiring any other attendance but that of supplying water to the boiler. The Patentee does not claim the apparatus applied to the hearth, as shown in his specification; but as it differs from that now in general use, he has given a description of it; but he claims the application of distilling apparatus, situated, as hereinafter described, below the level of the water line of the vessel. Fig. 11, Plate IV., is a section taken through the ship's hearth, boilers, and condensing apparatus: *a*, is the boiler, used for the ordinary purposes of cooking, which boiler is heated by the fire-place *b*; *c*, *c*, is another boiler, which surrounds the boiler *a*, from which boiler part of the steam arises for condensation; *d*, is a third boiler, adjoining the boiler *c*, extending from thence under the oven *e*, to the fire-place *f*: between the two boilers *c*, *d*, there is a communication, by means of a branch pipe *g*; and from thence the steam, arising from the salt, or other impure water, passes to the condenser *h*.

The Patentee states there is no novelty in this condenser, and that he does not intend to confine himself precisely to the form represented in the above description.

The fire being lighted in the fire-place, the hot air and smoke proceeds through the flues *i*, *i*, encircling the boiler *a*, and from thence passes into the chimney of the fire-place *f*. The steam arising from the salt water is condensed in the following manner:—At the bottom of the condenser *h*, there is a pipe *k*, communicating with the outside of the vessel; and at the top another pipe, also communicating with the outside. The cold water, entering at the pipe *k*, comes in contact with the worm of the condenser *h*; and having extracted the heat of the vapour generated by the boilers *c*, and *d*, rises in the condenser, and issues from the upper pipe. Fig. 12, exhibits a variation of the above condenser: *a*, is a pipe, leading from the boiler used to generate the steam from the salt water, and passes downwards by the bow of the vessel; by its being kept in contact with the cold water outside of the vessel, the vapour is condensed, and runs down the pipe into a cistern placed in any convenient part.—[*Inrolled in the Inrolment Office, November,* 1831.]

To WILLIAM ALFRED NOBLE, *Cross-street, Cherry-Garden-street, Bermondsey, in the county of Surrey, engineer, for his invention of certain improvements in applying the steam to the common and other engines.*—[Sealed 4th December, 1834.]

THESE improvements in steam-engines consists in having two pistons in one cylinder, one piston working within the other, by means of which the steam-engine makes double the number of strokes it would do if it had but one piston; consequently, a great economy of fuel takes place, and double the speed is obtained, without the aid of multiplying wheels. The steam is admitted through the steam ports, and forces up the two pistons together; the steam is then turned off into the condenser in the usual manner, which, as it is well understood by all practical men, it will be unnecessary to describe: at the same time, the steam is admitted through the steam port, between the pistons; the one is then forced upwards, and the other downwards; the before-mentioned action is then again repeated, which, being connected to the cranks by means of the connecting rods, the paddle wheel, or other machinery, is put into action.

The Patentee concludes his specification by observing, that he does not intend to confine himself to the operation of two pistons in one cylinder, as more might be used; but he states that two appear to be sufficient: he also further observes, that the principle of two or more pistons in one cylinder is also applicable to high-pressure steam-engines.—[*Inrolled in the Inrolment Office, June,* 1835.]

To Thomas Colman, *of St. Alban's, in the county of Hertfordshire, training groom, for his having invented an improved roller for horses.*—[Sealed 29th March, 1831.]

The object of this invention is to construct an improved elastic band to be used as a saddle, girth, or roller for horses, so as to allow of a more easy play to the lungs, which object is most essentially necessary for the good health and comfort of horses.

This improved roller is represented in Plate IV., figs. 13, and 14, the upper leather being removed to expose the spring; *a, a,* is what may be called the body or foundation of the roller. On this band small pieces of leather *b, b,* are fixed, for the purpose of preventing the upper leather, which is removed, from binding the springs *d, d*; *c, c,* are the straps passing to the buckles and webbing, and are formed as represented in the detached fig. 14: on the ends of these straps is fastened, by stitches, or otherwise, a projecting piece of leather *g,* which prevents the end of the strap from passing through the spring. The flat helical spring *d,* being coiled round the strap, and the strap and spring laid between the projecting pieces *b, b*; the straps are brought through the slits of the roller shown at *e, e*; the ends of the roller are then turned over and stitched on to the upper side, and when the straps are drawn to a sufficient tension in girding the horse, the spring is prevented from being drawn through the opening *c,* by means of its enlarged end, as seen at *f.* The rollers are then covered and padded in the usual manner.

The Patentee, in his specification, lays claim to every way whatever of giving elasticity to horse rollers in what way soever it may be obtained. Now, although we are perfectly willing to admit of the Patentee's right to claim elasticity in the manner above described, that is, by flat helical springs, yet we do not so clearly see his asserted right of excluding every body else from the benefit of making or using any other horse rollers in which the elasticity is gained in a way entirely different, such as by the means of Indian rubber, and other elastic substances; and we do not think that if such a case were brought into any court of law, it is very probable a verdict would be given for the Patentee.—[*Inrolled in the Inrolment Office, September,* 1831.]

To Robert Burton Cooper, *of Battersea-Fields, in the county of Middlesex, Esq., for his invention of an improvement or improvements on a cock or tap, applicable to fluids, liquids, gases, and for applying the said improvement or improvements to other useful purposes.*—[Sealed 18th May, 1831.]

This invention consists of a valve, formed as a sphere, or part of a sphere, accurately ground into a cavity, corresponding to its form in the shank of an ordinary cock in the main pipes, for water, gas, &c., or otherwise. The Patentee has also described it as applicable to many other useful purposes, as stoppers for bottles, used for chemical purposes, earthenware jars, &c., wherein it is desirable to prevent the evaporation of the matter contained within them, or prevent any effluvia to escape of a disagreeable nature.

In Plate IV. are exhibited some of the applications specified under the title of this patent. Fig. 15, represents the section of a stop cock, intended to be applied to a barrel, vat, or other ordinary purposes. Fig. 16, represents an outside view, looking in the same direction, similar letters referring to similar parts in the figures: *a*, *a*, is a spherical valve, having the aperture *b*, bored through it, which serves as a passage for the liquor, gas, or other fluid, which it may be desirable to draw off when the cock is open. This spherical valve is accurately ground to the shank of the cock *c*, *c*, which is formed in two parts, and secured together, so as to get sufficient pressure upon the valve *a*, *a*, for the purpose of preventing the liquor from escaping, by flanges, screw nuts, and bolts, as seen in the figures. The valve *a*, *a*, is provided with an axis *d*, which axis projects through the flanges on both sides of the cock, and is embraced by the handle or lever *e*. When it is desired to stop the flow of the liquor or gas through the cock, the lever *e*, is to be brought into the position shown by dots in fig. 15; the passage *h*, will then have travelled with it, and be in the position also shown by dots.

The Patentee states, that he does not confine himself precisely to the form of cock above described, as that may be varied considerably, without any alteration in the principle of the same, as the valves may be made of a half, or any other segment, of a sphere, when found desirable: a variation of this kind is shown in fig. 17, where *a*, is the valve, being a portion of a sphere, having its passage for the liquid, gas, &c., at *b*; the shank is similarly formed to that last described; but in this instance the passage of the liquor is stopped or opened, by means of the thumb piece *e*, which may answer equally well, as the lever, where the cock is not required of such large dimensions; it will be perceived that, on turning the thumb-piece *e*, round a sufficient distance, the solid part of the valve *a*, will be brought opposite to the aperture of the shank, and thereby stop the flow of the liquor, gas, &c. Fig, 18, shows an application of this invention to the main of an ordinary water or gas pipe: *a*, is the spherical valve ground to the pipe *f, f*, and kept in contact with it by the screw bolts, as seen in the figure; the valve is provided with a plug at top, which may be protected in the ordinary way: the action of this, it will be perceived, is precisely the same as that described in the former instances.

Some of the other purposes to which this improvement is applicable, will be seen in figs. 19, 20, and 21. Fig. 19, represents a bottle, for chemical or other purposes, having a spherical glass stopper ground to its neck. Fig. 20, is a representation of an earthenware jar, for similar purposes, having a hemispherical stopper ground to its mouth. Around the neck of this jar is securely fastened a metallic ring *b, b*, which carries a bearing for the cross piece *c*, screwed at its opposite end to the circular ring *b, b*. Fig. 21, is a similar application of this invention, for preserve, pickle, or other jars; the stopper *a*, is, in this instance, kept in its seat by the cover *c*, which screws on to the circular ring *b, b*.

The Patentee has described various other modifications of his improvement, as applicable to inkstands, &c.; but we do not think it necessary here to exhibit them.

In conclusion, he does not confine himself to a cock, as here represented, with only one passage, as they may be constructed with two or more ways, as occasion may require; and he states that in cases where hot liquor is to be drawn through them, the expansion of so large a body of metal may be guarded against, by forming the valves hollow, and allowing a free passage for the atmosphere, by a hole through the axle, as shown in fig. 15, at *d.*—[*Inrolled in the Inrolment Office,* 18*th November,* 1831.]

To WILLIAM DIXON, *of Walsall, in the county of Stafford, brass-cock founder, he having had communicated to him by a certain foreigner residing abroad, an invention of an improvement or improvements on the cock or tap, applicable to fluids, liquids, or gases.*—[Sealed 21st April, 1831.]

THE improvement specified under the title of this invention, is exhibited in Plate IV., figs. 22, and 23. Fig. 22, is a section of the cock, taken with the valve closed; and fig. 23, is a similar section, with the valve lifted or open: *a, a,* is a cap to the cock, carrying the shank, and having a screw thread cut upon its interior periphery; into this screw the tail piece *b, b,* is inserted, having an enlargement ground upon its upper end forming a seat for the valve *c*; *d, d,* is a cylindrical piece, forming the nose for the exit of the liquor, and turning freely round the periphery of the tail piece *b, b*: projecting from the tube *d, d,* and taking in a groove formed in the tail piece *b,* are two pins *e, e,* for the purpose of sustaining the tube *d, d,* and preventing it from falling from the tail piece *b.* The valve *c,* is mounted firmly upon the spindle *e, e,* which on its upper end is provided with a spiral worm *f,* which spiral worm takes into a female thread formed in the cap *a*, of the cock; at its lower end a cross piece *g*, is driven through it, and firmly fastened by a pin, or otherwise. This cross guide extends into grooves *h*, *h*, cut in the sides of the tail piece *d.* On turning the lever *i*, round about one-fourth of the circumference, the tube *d*, *d*, carries round the cross piece *g*, and with it the spindle *e*, *e*, the spiral worm of which coming into action with the female thread in the cap of the cock, draws up the valve *c*, and allows the liquor to pass through the tube *d*, *d.* When it is desired again to stop the cock, the lever is to be turned in the reverse direction, and the valve *c*, will be brought into its former position.

The Patentee states, that he does not confine himself to this particular mode of manufacturing the cocks, as it is evident that they may be made different in some of their parts from the drawing represented in our Plate; for instance, the cap *a*, may be cast in one with the tail piece *b*, and not fitted to it by a screw thread, as above described.—[*Inrolled in the Inrolment Office*, *Oct.*, 1831.]

To CHARLES HULLMANDELL, *of Great Marlborough-street, in the county of Middlesex, printer, for a certain improvement in the art of block-printing, as applied to calico, and some other fabrics.*—[Sealed 28th October, 1833.]

THE objects of this invention are stated to be the removal of certain difficulties and inaccuracies to which that part of the operation of block-printing, called putting up, are liable, and also to expedite the process. The Patentee states, that having procured the pattern or design which he desires to print, he takes a sheet of the thin transparent material, called isinglass paper or skin, and having laid it upon the design, traces the outlines of the design upon the transparent material, by means of an etching point. This process causes lines to be cut or etched in the isinglass paper, sufficiently deep to hold printing ink; and if any rough edges are produced by the etching point, they must be carefully scraped off.

The isinglass paper or skin being then spread out flat, may be coloured with the inking material, exactly as a copper plate would be treated; and all the superfluous colour being cleared off, the impression is to be taken from the etched isinglass paper on to a sheet of thin oiled silk, by the agency of an ordinary roller press, the oiled silk being stretched out upon the table of the press, and the etching placed upon it.

The impression or print thus obtained is to be transferred to the ordinary printing block, by spreading its face thereon, and slightly rubbing the back of the silk. The one tracing on the isinglass paper will give a great number of impressions to a succession of pieces of oiled silk, which being in this way employed, and their patterns transferred to the block, a repetition of the pattern or design may, in a few minutes, be given to the block in a very perfect way, and prevent the necessity of a draftsman attending to correct errors in the drawing.

As the isinglass paper or skin will not bear the application of water to its surface, it is to be observed that the inks or colours employed must be of the kind called fatty inks.

Various coloured inks being necessary to print a pattern, the Patentee has given recipes for mixing several of them suited to the object; but desires it to be understood, that he does not intend to claim such mixtures as of his invention.

For a varnish:—Take some burnt linseed oil, and mix with it a little tallow and some sweet oil; lay this by for use.

For red ink:—Mix some of the above with as much carmine as it will take; the stiffer the ink is made by adding colouring matter, the sharper the impression will be. Previous to throwing off or transferring the impression to the block, the latter must be well washed with a solution of caustic potash, or soda, and allowed to dry; and let it be recollected that with this ink, as well as with all the following, immediately, or some time after the impression is taken, a sheet of clean paper must be put over or laid on the block, and a hot iron run over it, to fix the ink; while the wood is still hot, pour over it a solution of alum, and if the yellow tinge, produced by the caustic potash, or soda, still remains, and it is wished to be removed, a weak solution of muriatic acid will effect the purpose. You may, in grinding this ink, add a small portion of dry soap.

For black ink:—Take about equal parts of nitrate of silver, commonly called luna caustic, and varnish; add a little lamp black, merely to colour the ink, and grind the whole well on a glass or marble slab. For this ink, the block may be washed with a solution of caustic, potash, or soda.

The block may be washed with a solution of wax in turpentine varnish, and in that case lamp black only may be used for throwing off impressions: when this is adopted, no hot iron after the transfer is necessary, but merely hold the block near to the fire, and this will fix the pattern.

For blue ink:—Grind equal parts of green sulphate of iron, dried over the fire with common red ochre, or any colour containing iron, and add a little indigo, to give colour to the ink, with some varnish, and wash the block with prussiate of potash and caustic soda or potash. After the impression has been fixed with a hot iron, pour some diluted muriatic acid on the whole to bring out the colour, but observe the lines will smear if touched with a brush.

For blue ink with indigo:—Grind very fine some indigo with varnish, and, if it is thought proper, some yellow orpiment. Wash the block with a solution of caustic potash.

The Patentee says, it is evident that my invention is applicable to all those styles of block printing where the process called putting on is used; and various modes of availing himself of it, in the whole or in part, will occur to the manufacturer, which it would be unnecessary here to enumerate: thus, for instance, when part of the pattern is made from engraved rollers, the remainder may be traced on isinglass paper; or where the brassed blocks, as they are called, are used, an impression may be taken from them on fine oiled silk, and then such parts of the pattern as are to be transferred to blocks may be outlined by hand on the silk with the aforesaid inks, and the silk then turned over on the block, and an impression given of the pattern on the block, without the ordinary hammering on the back of the block.

Another great advantage of this mode of proceeding, as regards brassed blocks, is, that though the whole brassed pattern will be given on the oiled silk, only so much as is necessary need be transferred to the other block, which will cause much less confusion. It is only necessary further to add, that the transparent substance used should be kept in a dry place, and when engraved, if laid by, will serve to renew the pattern at a very short notice at any time when required, and when no longer wanted may be dissolved and formed into new sheets.

In conclusion, I claim as my invention, etching a copy of the pattern to be used in block printing on a transparent substance, such as the said isinglass paper, and then by means of coloured inks suited to the transparent substance used for the etching, as also to the wetting of the blocks when cutting, throwing off a print from the etching in an ordinary copper-plate printing press in manner aforesaid upon a thin oiled silk, and transferring the same to the block while the ink is wet, by turning that side of the silk containing the impression over on to the block, and applying slight friction and pressure to the back of the silk, as aforesaid.—[*Inrolled in the Inrolment Office, April,* 1834.]

To DOMINICK STAFFORD, *of Duke-street, Adelphi, in the county of Middlesex, and late of the city of Paris, for an improvement in fuel, being a communication from a foreigner residing abroad.*—[Sealed 2d November, 1833.]

THIS invention of certain improvements in fuel, consists of a combination of the following articles; viz. sea coal, brick hearth, blue clay, river sand, or other deposits of running streams or stagnant waters.

The Patentee proposes that the proportions of the sea coal to any other of the ingredients be about equal; and that when the different substances are well pounded, they are then to be mixed together with tar, or tar diluted with water, till they gain such a consistence, that they may be made into the shape of cakes, balls, or any other convenient form; they are then dried by the sun, or any artificial heat, when they will become hard and fit for use. The Patentee states that the quantity of coal may be varied, according to the slowness or quickness of the combustion required.—[*Inrolled in the Inrolment Office, May,* 1834.]

To BENJAMIN COOK, *of Birmingham, in the county of Warwick, brass-founder, for his having invented an improvement in the application of a material, hitherto unused, in the manufacture of paint, varnishes, and for various other purposes.*—[Sealed 22d March, 1832.]

THE Patentee states that his invention consists in substituting a material never before used, for the purposes of making paint, varnish, lacquer, &c., in place of the ordinary alcohol, now employed for those purposes. This material he describes as the alcohol arising from fermented dough, in the process of baking, which, he states, may be used with much less expense, and equal advantage. He does not specify any particular mode of manufacturing the paint, varnish, &c., but merely claims the application of the before-mentioned alcohol for the purpose of mixing them.—[*Inrolled in the Inrolment Office, September,* 1832.]

To Louis Cournier, *of Kennington-Green, in the county of Surrey, gentleman, for an improvement in curing certain maladies of the head, being a communication from a foreigner residing abroad.*—[Sealed 21st September, 1833.]

From the title of this specification, we have no doubt but that our readers will fly to the description, anxious to become possessed of the secret of so invaluable an invention, as a cure for that unrelenting persecutor, the head-ache, rheumatism, &c. We regret to inform our readers that it is not, we believe, in our power to put them in possession of any thing extremely new; but, such as it is, we submit it to them, hoping that there is some occult virtue in it which we have not been able to discover.

The Patentee has not treated us with a very long specification, but has been particularly kind in describing to us the form and appearance of his newly-invented instrument; but as we do not think it necessary to inform our readers how it is ornamented with coloured paper, the precise dimensions, &c. &c., we shall content ourselves with briefly describing the formation of the instrument.

Having obtained a small glass box, open at the top, and closed at the bottom, a hole is perforated in the closed part, for the purpose hereinafter described. In this box is fitted a piece of cork, of corresponding widths, but not so deep, and is covered, both on the upper and under surfaces, with a thin piece of lead: from the upper side a quantity of needles, thirty-six in number, project, extending very nearly to the upper surface of the glass box. A thin metallic thread is then affixed to the upper surface of the cork, passes round it to the back part, and is then drawn through the hole, perforated in the closed part of the glass box. This thread is sufficiently long to lay upon the ground at the time that the instrument is to be used; the mode of applying it is as follows:—

By means of strings affixed to it, the glass is to be applied to the affected part, when the electricity will pass off by means of the metallic string, through the box before described.

The Patentee states that he does not confine himself to the number of points employed, or to the formation or size of the box, &c., as the same may be varied, without affecting the principle of the invention.—[*Inrolled in the Inrolment Office, March*, 1834.]

To THOMAS SPINNEY, *of Cheltenham, in the county of Gloucester, gas-engineer, for a new combination of materials for the manufacture of crucibles, melting pots, and fire bricks.*—[Sealed 11th May, 1833.]

THIS invention is for an improved combination of well known materials, which are now in use, for the purpose of making melting pots, crucibles, fire bricks, and various other useful articles, and consists of the following combination; viz. fire clay, as Stourbridge clay; burnt clay; sand, which the Patentee prefers, to be as free from lime as it is possible to be obtained; and pipe or potter's clay, which he prefers to use in the following quantities, estimated by weight: viz. of fire or Stourbridge clay, twenty parts; of burnt clay, four parts;

of sand, eight parts; and of pipe or potter's clay, four parts.

The Patentee, however, observes, that a very great degree of nicety is not essential in the proportions of the materials used, as the several quantities may be very considerably varied, and yet a beneficial result may be obtained.

The Patentee further states, that the way in which he mixes the materials is as follows:—The pipe clay must be ground very fine, and care should be taken that it be first well dried; it is then mixed with the sand and other ingredients, when water is poured in, till it is brought to a consistence proper for moulding and tempering, when it is ready to be burnt or baked.

The Patentee observes, in conclusion, that he does not limit himself to the use of Stourbridge clay, nor to the exact proportions before mentioned, as other fire clay, and different proportions may be used, as before described, with a beneficial result; but he confines his claim to the combination of fire clay, sand, and pipe or potter's clay, for the purposes mentioned above.—[*Inrolled in the Inrolment Office, March*, 1834.]

SCIENTIFIC NOTICES AND NOVEL INVENTIONS.

FRANCE—SUGAR FROM BEET-ROOT.

The extension of the manufacture of sugar from beet-root is at present immense; more than fifty refineries have been erected this year; and there is every reason to believe, that, in a few years, the manufacture of beet-root sugar will not be more expensive in France than that of colonial sugar. M. Derosne believes himself able to affirm that, in many places, the quintal, equal to fifty kilograms (about 112 lbs. English) of beet-root sugar will not cost twenty-five francs. The substitution of a more complete apparatus, the general improvements in the manufacture of sugar, the use of animal charcoal, and of the Dumont filtre, have constituted these results and anticipated advantages.—*Bul. de la Soc. d'Encouragement pour l'Industrie Nationale,* No. 359, p. 125.

FIRE-MASK.

The above number contains the report of a new fire-mask, invented by M. Paulin, for the protection of firemen in cellars and confined places when on fire. This mask consists of a mantle and capuchin, or hood, made of cow or other skin, with a glass mask for sight; the joints of the work are fastened by copper bands. A tube descends from the upper part of the hood to the lower, to which is attached a syringe, or small forcing pump, which supplies from below a pure air for respiration, whilst the fireman is employed in his duty. A whistle-tube enters the mask to the mouth, by which means the fireman is enabled to give signals to his comrades.

A special commission, to whom this invention was submitted, testifies its conviction of the great utility of the apparatus.—*Ibid.* p. 148, &c.

GERMANY—STUTTGARD—HOT-AIR BLAST FURNACES.

The improvements lately adopted in some of the English smelting founderies have been transferred to the iron-works of this place. The air is heated in its passage through bent tubes, disposed immediately under the furnace to 140° and 180° Reaumur—347 to 436° Fahr. The saving of fuel is found to be from one-fourth to one-third, and the operation of smelting is more expeditious.—*Ibid.* No. 370, p. 176.

NEW APPLICATION OF CAST-IRON.

Experiments have been made at the founderies of Rubeland, in Saxony, for the casting of iron bells. It has been established, by these trials, that the bells are lighter, more economical, and more sonorous, than those of bell-metal, and that they resist the strongest cold without alteration. An endeavour has also been made to substitute large steel tongues for the bells, similar to those already in use for clocks. A cast-iron stereotype edition of the "Bible" has also been printed at the expense of only thirty sous (fifteen-pence English).—*Ibid.* No. 370, p. 177.

CARLSRUHE.

A Society of Arts and Trades has lately been formed at this place, composed principally of manufacturers and artisans, for the encouragement of talent in the Grand Duchy of Baden, by the distribution of premiums, and by the publication of a scientific journal. This society has requested to enter into correspondence with the "Societé d'Encouragement," &c., and to receive its bulletin. The city of Carlsruhe has already possessed, for some years past, a polytechnic school, where they teach mathematics, natural history, civil architecture, mechanics, &c. Several able professors are attached to this institution.—*Ibid.* No. 370, p. 177.

This number gives an account of several English improvements in the paddle-wheels of steam-boats, and a notice of the Thames Tunnel, under the direction of Mr. Brunel.

COMB-CUTTING MACHINES.

These instruments have been lately constructed in London, and exported to France, where they bear a high price. The above number gives an account of their construction. A prepared flat piece of horn or tortoise-shell is placed upon a carriage, moved forward by means of a screw, until it comes under the action of a ratchet wheel, toothed upon a portion of its circumference; the teeth of this wheel bring a lever into action, furnished with a cutting knife, which cuts a double comb out of the flat piece submitted to its action, the teeth of which are opposite to each other; and by this operation, no part of the substance is lost, as is the case in cutting the teeth of combs in the ordinary manner. The same carriage will also carry a flat piece of horn, shell, or ivory, in the hard state, to a circular saw, which cuts the teeth in the ordinary way, but with such exactness, that eighty to one hundred teeth can be formed, by a proportionately fine circular saw, in the space of one inch.

The Bulletin speaks of the invention as belonging to Mr. Rodgers; but the machines exported are constructed by two engineers, on the Surrey side of London, and are very simple and compact in their form.

MACHINE FOR SILVERING PLATES OF GLASS—MR. FARROW'S INVENTION.

This is formed of wooden blocks, covered underneath with skins. The blocks are fixed upon a beam, moving, in guides, upon a carriage, which traverses the length of the table, upon which the plate is laid on the prepared mercurial tin-foil. A screw acts upon the beam, which causes the clothed blocks to descend with an equal pressure upon the surface; and thus, passing transversely over the whole length, an uniform adhesion of the silvering is produced.—*Ibid.* No. 370, p. 182.

POTATOE BREAD.

In a memoir upon this subject, by M. Boucharda, M.D., it is stated that the cultivation of wheat in many departments of France is a very uncertain and variable employment of land; and that in the present state of agriculture, a piece of land, planted with potatoes, will yield, upon a yearly average, seven times the quantity of nutritive matter which a similar field, sown with wheat, would produce.—*Recueil Industriel, &c.* Tom. v. p. 6, &c.

POTTERIES.

A method has been lately introduced for bringing the "barbotine" (*i. e.* the mixture of the several prepared ingredients) to a proper consistence for working, by means of pressure, in lieu of drying the mixture. The barbotine is put into sacks, which are placed in square presses, capable of operating upon 3,000 kilograms at a charge; and the screw is applied gently, and at various times, until the pressure has discharged the superabundant water. A great saving is effected by substituting this process in lieu of that of desiccation by fire. In a kiln, drying 6,000 kilograms of barbotine, forty to fifty francs per diem, during half the year, will be saved in the consumption of coal by the new process.—*Ibid.* p. 30, and seq.

UNITED STATES, NORTH AMERICA—CANALS.

They have commenced in America the construction of a grand canal, across the chain of the Alleghany mountains, which is to join the Chesapeake to the Ohio. This canal, which establishes the communication between the Atlantic Ocean and the Western States, and with New Orleans and the Gulf of Mexico, by the Ohio and Mississipi, is about 137 leagues in length, and will have 398 dams and locks upon its line. It goes from Washington, following the river Potomac, till it reaches the Alleghany; from thence it débouches upon the Ohio, at Pittsbourg. This canal will carry boats of sixty tons; its breadth at top is about fifteen metres, shelving to ten metres at the bottom; depth 1·5m. The locks are about five metres breadth by thirty-two length. The total expense is estimated at 121,275,000 francs (about five millions sterling). This canal was commenced in 1827, and the distance between Washington and the Point of Rocks, above fifty miles, has been completed. Great difficulties have presented themselves in the course of execution. An iron railway from Baltimore has joined the canal a little below the city of Frederick.

Communications have been established between New York, Philadelphia, and Baltimore, by means of a canal from the Chesapeake to the Delaware; another to Raritown; another penetrating the interior to Easton; and four iron railways. These canals are less remarkable for their extent than for the size of their cut, which permits ships of 300 tons, drawing more than two metres water, to sail without obstacle upon them. They form part of a general system of interior navigation, parallel to the coast, uniting the deep bays which run up the country, so that, in time of war, as well as in peace, under the protection of a few forts constructed upon the exposed points and the mouths of the rivers, commerce may be safely carried on along the whole line of this coast.—*Bulletin d'Encouragement, &c.* No. 369, p. 154.

NEW BRIDGES.

At present they use in America a new sort of bridge, very economical in their construction, and of sufficient solidity. They are merely constructed of planks, crossed over each other, and fastened with wooden pegs; they have no beams, excepting in the flooring and roof. The system, which has for its inventor Mr. Town, is applicable to all sizes of bridges, and offers the following advantages:—1st. A great economy in the construction. 2d. They do not exercise any pressure upon the abutments and piles. 3d. They leave the passage entirely open to vessels in the manner of suspension bridges. 4th. They allow the construction of a moveable platform or bridge-gate, for the passage of sailing vessels, without injuring their solidity. 5th. The repairs of these bridges are readily made.—*Ibid.* p. 134.

REMARKS AND CALCULATIONS ON THE BEST FORM FOR RAILWAY BARS, &C. BY R. STEPHENSON, ENGINEER.

This paper contains a demonstration of the superiority of the elliptical form, in section, of iron railway bars to the flat or parallel bars. The author observes, "that the difficulty of manufacturing, and a proportionate increase in the expense of the elliptical rail, has, it is believed, been the principal causes of its rejection by some. With respect to the difficulty of manufacturing—if any really exist—I am convinced it arises from inexperience, as the operation consists, in addition to the rolling of ordinary bar iron, of merely once or twice passing it through the rollers, by which the elliptical shape is given; this operation occupies but a few seconds. It is not improbable that the true source of this objection is to be found in the fact that it is difficult, if not impracticable, to introduce into the elliptical shaped rail iron of an inferior quality, as the nature of the process almost invariably detects it. It is not found by experience that iron of the best quality is sensibly injured, by the process of rolling into the elliptical form.—*Journal of the Franklin Institute*, vol. xv. p. 2.

REPORT UPON THE EMPLOYMENT OF HOT AIR IN SMELTING IRON, &C. BY M. E. GUEYMARD, ENGINEER.

A successful experiment in the smelting of iron, by the aid of the hot air blast, has been made at the furnace of Rioupéroux, department of Isere. The general result has been upon the average of three months, an increase per month of the number of the charges into the furnace from 1,104 to 1,434—making a nett saving in the quantity of charcoal consumed, after deducting expenses—of 1,200 francs (50*l.*) per 1,000 kilograms= one ton of casting produced. The maximum effect produced was with a pressure blast=24 inches of water; the temperature of the blast 130° R. (324° Fahrenheit.) This temperature was below that of the experiment made at Vienna, in a coke furnace, at which the hot air blast was raised to 604° Fahrenheit; but M. Gueymard has observed, that the production of iron was not augmented by an elevation of the temperature above 130° Reaumur.—*Ibid.*

NEW COMET.

The Journal of the Two Sicilies, of June 16, states that Sr. Bogalowski, director of the Royal Observatory, at Breslaw, discovered a new telescopic comet, on the 20th April, in the Constellation Patera, to which, if still visible, the attention of other astronomers is directed.—*Paris Advertiser.*

HORNS OF THE URUS FOUND IN FRANCE.

In digging for peat in the commune of Auxy le Château, in the Pas de Calais, there have been found some petrified horns of the urus, or auroch, an animal of the same species as the bull in its savage state, but which has long disappeared from this country. Two of the horns have been deposited in the Museum at Arras.—*Ibid.*

AN ANCIENT SHIP DISCOVERED AT CALAIS.

In making a new sluice to the citadel of Calais, an ancient vessel, forty-five feet in length, twelve in breadth, and eight in depth, was discovered in the ground, strongly built, though its measurement does not exceed eighty tons; it has evidently never been covered with a deck. Coins were found in it, with the date of 1219; and as it lay twelve feet below the foundations of the inner wall of the fortifications, erected by the Count de Boulogne, it is presumed that the vessel was not discovered at that period. It cannot be ascertained whether it was ever at sea; but there is reason to believe it was erected before Calais was made a regular port, and when the sea ran far up the present land.—*Ibid.*

EARL GREY STEAM-VESSEL—STEAM BOAT EXPLOSION —INEFFICACY OF THE SAFETY-VALVE.

If the trial of the engineer of the Earl Grey steam-boat (in whose acquittal we entirely concur) proves any thing, it proes that no reliance can be placed on the safety-valve in preventing such a dreadful casualty as that which befel the Earl Grey. It appears, from the evidence of several practical engineers who were examined on the occasion, that so far from the valve operating in all cases as a safety principle, that it has a tendency to act the very reverse—to become "gagged" or locked down, without any apparent cause, all of a sudden; and in such cases the valve will not rise, however great the pressure of the steam may be in the boiler. It follows, that if, by any accident, this circumstance has not been observed, the result is inevitable; the boiler explodes—and, perhaps, every cause but the true one is assigned for the catastrophe. As the subject is an interesting one to scientific men, and is of the first importance in its bearing upon human life, we beg to suggest that the Society of Arts, or other scientific body, should stimulate the inventive faculties of mechanics and engineers to the discovery of a substitute for this capricious agent, by the offer of a suitable reward to the inventor. As the lives of all on board lie at the mercy, so to speak, of the element confined in the boiler—nothing which regulates the explosive force of steam should be left to the operation of chance.—*Edinburgh Evening Post.*

The engine of the Earl Grey was a common condensing, not a high-pressure engine; it was made by Mr. Mansell: the safety-valve was on the common construction governed by a lever; this mode is not so usual as by a perpendicular pressure by means of weights. The engine was well made, but she had no stays internally; the boiler was nearly new, it had been put in about six weeks before the explosion; it did not appear to have burst from any particular weakness.—*Evidence on the late trial of Hugh Davidson, the engineer of the Earl Grey.*—Ed.

SOUTH WALES.

At Swansea, exertions are making to set on foot (on water?) a steamer, to pass and repass daily across the British Channel to Ilfracombe. By this, an uninterrupted communication will be thrown open from the Land's End, through South and North Wales, to Liverpool. At Neath, a scientific institution has been formed, which calls forth a course of lectures from the Rev. W. B. Conybere, on that important subject, especially in Wales—geology. A new road is about to be formed from Neath to Merthyr Tydvil, which latter place is lighted with gas. At Newport, in Monmouthshire, excavations are made for the foundation of a new church on the plan of Mr. Wyatt. An immense building is in progress for the introduction of the hardware manufacture, and in ship-building they are "launching out" incessantly.—*Morning Herald, Sept.* 16.

NEW EXTRACT FROM TALLOW.

This substance, which M. Lecanu, the discoverer, calls *stearine*, does not grease the fingers like tallow; it is dry and hard as wax, without any kind of smell even when it is melted. Fusible at 62° R. (171.5° Fahrenheit), lightly soluble in boiling alcohol, from which it separates in cooling: hot ether dissolves it freely; and, upon cooling, deposits it in pearly flakes; burnt in the open air, it consumes, like other fat bodies, but without their disagreeable scent.

Stearine may be easily extracted from tallow; in treating the latter with five or six times its weight of boiling ether, it dissolves the tallow completely, and upon cooling, precipitates the stearine, which may be also obtained equally well by dissolving the fat in hot spirits of turpentine, which, upon cooling, deposit the stearine. This latter is an economical process, which succeeds very well, and yields from mutton fat more than one-third of its weight of stearine, fusible at 60° R. (167° Fahrenheit.) This new substance is considered highly advantageous for the manufacture of candles, which have the preference of those made of spermaceti, or with margaric acid, being less fusible. Spermaceti melts at 44° R. (131° Fahrenheit); and margaric acid candles considerably below 60° R. Stearine candles gutter less than those of margaric acid, and may be manufactured at a lower price, because the matter is extracted by a low-priced solvent, directly from the suet or tallow, without subjecting it to any further process.—*Annales de la Société Polytechnique Pratique*, No. 12, II. partie.

PATENT LAW AMENDMENT BILL.

Since our last publication, the Act for the amendment of the law touching Letters Patent for Inventions has, after much discussion and a conference between the two Houses of Parliament, received its final alterations and the royal assent; it bears date the 10th September, 1835. Excepting numerous technical amendments, the Bill does not embrace any improvements; it is much in the state of inefficiency as a measure of reform, in which our last notice of it in this journal left it. Almost every member of the Commons who spoke upon the subject, looked upon the present Bill as a mere forerunner of a substantial and broad measure to be introduced in the ensuing session. There exists in the House a general impression that the price of patents ought to be materially reduced; this feeling is a point *d'appui* in advance. We beg leave to draw the attention of our readers to the republication of the series of communications upon the subject of patent law amendment which has been made to this journal—as announced upon our covers. We have been induced to republish these letters, with the addition of many useful documents and tables relating to the subject, both on account of its intrinsic importance, and with a view of affording to members of Parliament, and to the numerous class of scientific men and inventors interested in the question, a connected and compact view of its principal bearings, and of the opinions of public bodies and writers as to the nature of the evils to be remedied, and the most efficacious means of amendment. An attentive perusal of the small volume announced, will make any person a tolerable master of the entire subject.

List of Patents

Granted by the French Government from the 1st of January to the 31st of March, 1835.

PATENTS FOR FIFTEEN YEARS.

To Antoine Perpigna, of the French and Foreign Office for Patents, 4, Rue Choiseul, for improvements in locomotive carriages to be used on common roads.

To John Houldsworth, represented in Paris by Mr. Perpigna, for improvements applicable to machines used for preparing wool or any other kind of fibrous substance.

— George Little, of Liverpool, represented in Paris by Mr. Perpigna, for improvements in weighing machines.

— Marion de la Brillantais, represented in Paris by Mr. Perpigna, for an improved kind of mill for grinding corn.

— Anselme Lair Lamotte, of St. Malo, for a new method of dressing skins with tar.

— Jean Stoddard, of Paris, for a rotatory steam-engine.

— Roard de Clichy, of Paris, for a new method of extracting oil from linseed, or any other kind of seed.

— Joseph Clerc, of Paris, for a moveable apparatus for evaporating liquors by means of hot air.

— Tossin, Father and Son, of Paris, for a new manner of setting precious stones, and inserting them in hard substances, thereby producing a new kind of mosaic.

— Charles Chesseborough Dyer, for a machine for making paper of all dimensions.

— Houzeau Muison, of Rheims, for a new method of producing gas for illumination.

— Bernhart, Lacarrière, and Co., for an improved method of extracting gas for illumination from any kind of seed, and especially from grape-stones.

— Edward Lanet, of Bordeaux, for an improved letter-copying apparatus.

— Charles de la Morre, of Bordeaux, for an improved method of drying cod, or any animal or vegetable substance, by means of stoves with a continuous current of hot air.

— Nicolas Clement Desormes, for a method of manufacturing thin sheets of glass, either for looking glasses or glazing.

— Eugene Valentin Ledoux, for improvements in the mechanism used for casting printers' types, whereby a great number of letters may be cast at once.

— Daniel Dunn, of London, for improved instruments calculated to introduce the galvanic fluid into the human body, and thereby facilitating the cure of certain diseases.

To Guigo and Maniquet, of Lyons, for improvements in the Jacquart frame.

— Desbassyns de Richemont, and Buret, of Paris, for a method of preserving any kind of food without the agency of heat.

— Charles Hervieux, of Nantes, for a new motive power.

— Jean Casile Dubost, of Lyons, for a new method of manufacturing sulphate of magnesia.

— François Joseph Dizi, of Paris, for an improved piano.

— Francois Cabrol, of Paris, for an improved method of projecting hot air into furnaces.

PATENTS FOR TEN YEARS.

To Jean Baptiste Nicolas Theodore Thomas Nodler, of Paris, represented in Paris by Mr. Perpigna, 4, Rue Choiseul, for improvements in mills used for grinding corn.

— Jacques Bouchet, of Montendre, represented in Paris by Mr. Perpigna, for a method of manufacturing summer hats for gentlemen.

— Menou, junior, of Deville les Rouen, for a method of printing silk, cotton, and any other fabric.

— Jean Baptiste Royer, for a paste for sharpening razors.

— Madame Absil, of Paris, for a new belt or truss for the cure of hernia.

— Pierre Pradal, of Carcassonne, for a new angular reflector to be applied to street lamps.

— Francois Xavier Deverte, of Paris, for a machine for laminating carded wool.

— Charpy and Pommier, of Lyons, for an apparatus for stretching and dressing all kinds of tissues.

— Vincent Labbée, and Jacquot, of Rheims, for a machine for drawing woollen rags into wool, and thus rendering capable of being spun again.

— Louis Stevenaux, civil-engineer, of Balan, for a machine for stamping culinary utensils.

To Alexandre Joachim Fontance, of Paris, for a bread-making machine.

— Louis Gauthier Delatouche, of Paris, for an improved portable oven for culinary purposes.

— Pouillet, Brothers, of Paris, for an improved mitre of bishop to be placed on the top of chimneys.

— Moses Poole, for improved machines for making pins, needles, rivets, screws, and nails.

— Antoine Francoise Jean Claudet, of London, for a machine for cutting glass cylinders.

— Charles Dietz, of Paris, for a locomotive carriage calculated to travel on common roads.

— Jean Bonhomme, of Paris, for a new kind of easel.

— John Byrne Madden, of Paris, for a dragging machine called by him the *hydraulic plough*.

— Pierre Antoine Narcisse Bobœuf, of Paris, for a method of raising every kind of sunk engraving, so that it may be printed by the typographic printing press.

— Louis Barthelemi Cheronnet, of Paris, for a ventilator for disinfecting privies, vaults, and sewers.

— Simon Wolff, of Paris, for a new portable stove to be heated with spirits of wine.

PATENTS FOR FIVE YEARS.

To James Perry, represented in Paris by Mr. Perpigna, 4, Roi Choiseul, for certain improvements in the manufacturing of maillechort.

— Carré Villette, of Chalons, represented in Paris by Mr. Perpigna, for a method of replacing animal charcoal by another substance.

— Bedfort and Nepveu, of Paris, for a new kind of *diorama*.

— Jacques Ducel, of Paris, for a new method of making beet-root sugar.

— Madame Sorix, of Paris, for two moveable ranges of keys to be adapted to pianos.

— Simon Lefevre, of Paris, for improvements in the flute.

— Jean Baptiste Jerome Chomel, of Montreuil sur Mer, for an apparatus for extracting the saccharine juice from the pulp of beet-root.

To Grangier, Brothers, of St. Chamont, for a new method of ornamenting ribbons with only one shuttle.

— Emilland Goin, of Paris, for a new method of fixing corks in the neck of bottles.

— Muel Doublat, of Ablainville, for the application of the kind of iron called tire iron to the suspension of bridges and the roofing of houses.

— Auguste Dalmassy, of Nice, for an improved printing press.

— Buran and Payen, of Paris, for a new method of purifying fecula.

— Francois Xavier Pilliot, for an improved system of suspension for lamps of carriages.

— Charles Amable Desgénétais, of Paris, for a pectoral paste.

— Barthelemy and Royet, of Paris, for a method of curing corns without extirpation.

— Michel Désiré Pradier, for a complete shaving-box.

— Pierre Marie Touboulic, of Paris, for an improved kind of paddle-wheel.

— Joseph Krafft, of Mulhausen, for a cylindrical power machine to be used as a propeller.

— Auguste Magloire Jullienne, for an apparatus whereby the steam lost in high-pressure engines is turned to account, and a great economy effected.

— Chabrier, junior, of Paris, for an improved lamp-burner.

— Joseph Eboli, of Lyons, for improvements in the manufacturing of candles.

— Pierre Ferrand, of Paris, for an improved set of sails filled with gas, and to be used for directing balloons.

— Bergier and Mallay, of Clermont Ferrand, for a new thrashing machine.

— Leavers and Houston, of Caen, for a new steam-box for fire-engines.

— Madame Marie Bisso, of Paris, for improvements in weaving frames.

To Jean Louis Thomas Castier, of Corbeil, for a machine for sifting the groats used for making vermicelli.

— Pierre Jacques Messier Adam, of Elbeuf, for an economical composition to be used in the spinning of wool.

— Pasteur d'Etreillis, of Paris, for the application of the moss called sphagnum, and the sea plant called zottera, to the making of mattrasses.

— Vantouillac, senior, of Lavaur, for a stove for smothering cocoons.

— Jacques Robert Lavenne, of Paris, for a new kind of perfumed letter paper.

— Francois Xavier Progin, for a new steam-engine.

— Etienne Dartois, of Besancon, for a new method of ornamenting with glass the frames of pictures.

— Gregoire Isidore Deslauriers, of Paris, for improved anti-catarrhof lozenges.

— Nicolas Bruet, of Dijon, for a new method for the noting and transposing of music.

— Louis Pierre Dauphin, of Paris, for improved water-proof shoes for gentlemen, and made without seams.

— George Violard, of Paris, for a new kind of blond lace.

— Hallette and Boncherie, for a new apparatus for extracting from the beet-root the whole of its juice without using the press.

— Alexandre Edouard Lemott, of Paris, for the composition of medicinal wines.

— Douté and Mercier, of Louviers, for a new machine for the spinning of wool and producing a continuous sliver.

— Joseph Frideric Charrière, of Paris, for improvements in the surgical operations used for amputations.

— Francois Tripot, of Paris, for a machine for preparing the rags to be converted into paper.

— Frideric Prœschel, of Paris, for the manufacturing of a vegetable produce to be used in place of horse-hair.

— Calman Duverger, of Soissy sous Etiole, for a new kind of spring.

ADDITIONAL SPECIFICATIONS INROLLED BY THE FOLLOWING PATENTEES.

To Messrs. Bland, Jones, and Co., of Manchester, represented by Mr. Perpigna, 4, Rue Choiseul, for improvements on their patent throstle and spinning frames.

— Antoine Perpigna, of No. 4, Rue Choiseul, Paris, for improvements on his patent instantaneous fire-apparatus.

— John Johnson Wickam, of Paris, for improvements on his patent mechanical apparatus for ascertaining the size of each person, and the pressure required to contain the hernia.

— Antoine Galy Cazalat, of Paris, sixth improvement on his patent steam-carriage which is to travel on common roads.

— Auguste Joseph Victor d'Asda, of Paris, for improvements on his steam generator.

— Casimer Lefaucheux, of Paris, fourth improvement on his fire-arm to be loaded at the breech.

— Pierre Joseph Mozard, of Paris, for improvements on his method of manufacturing a safety paper.

— Jean Baptiste Clussman, of Paris, second improvement on his method of tuning pianos.

— Auguste Barbier, of Paris, for improvements on his pump to be used in wine-shops.

— Joseph Menuel, of Paris, third improvement on his liquid soap.

— Roard de Clichy, and Drouillard, of Paris, second improvement on his chemical process for making carbonate of lead.

— Louis Jerome Perrot, of Rouen, second improvement on his process for printing tissues.

— Careau, of Bievere, second improvement on his mechanical lamp.

— Francois Cabrol, of Paris, for improvements on his method of projecting hot air into furnaces.

— Beatus, Beringer, of Paris, for improvements on his fire-arm.

— Gibbons Merle, of London, for improvements on his portable gas kitchen.

To Selligues, civil engineer, for improvements on his instruments for boring Artesian wells.

— Pierre Francoise Chatelain, on his embroidering machine.

— Felix Jean Baptiste Pidt, fourth improvement on his system of railroads.

— Letestu and Girond, on their mechanical lamp.

— Careau, of Bievere, on his mechanical lamp.

— Victor Amedee Lavoipierre, of Paris, on his new kind of buckles.

— Roth and Dufau, on their process of extracting pure turpentine from the maritime pine.

— Francois Grille Houderville, junior, on his power-engine.

— Pierre Lacaze, of Nimes, on his plough.

— Jean Antoine Gervais, on his machine which is to produce a perpetual motion.

— Pouillet, Brothers, on their new method of warming houses.

— Gilbert Lamotte, on his water closets.

— Pierre Alexandre Lemare, on his apparatus for heating baths.

— Henry and Perrin Lepage, of Paris, for their fire-arm to be loaded at the breech.

— Felix Godefroi Bouvier, on his apparatus for preventing chimneys from smoking.

— Becker and Co., of Strasbourg, on their rotatory pump.

— Barthelemi Bouyou, on his hydraulic machine with centrifugal force.

— Francois, Brothers, of Nantes, on their harpoon for whale-fishery.

— Joseph Clostre, of Paris, for a new kind of ornamental brass tube.

— Alexandre Francois Selligue, on his new gas light for illumination.

New Patents

SEALED IN ENGLAND,

1835.

To James Fergusson Saunders, of Tenterden-street, Hanover-square, in the county of Middlesex, gentleman, for improvements in clarifying raw cane, and other vegetable and saccharine juices, and in bleaching such raw juices, being a communication from a foreigner residing abroad.—Sealed 1st September—6 months for inrolment.

To John Joseph Charles Sheridan, of Walworth, in the county of Surrey, chemist, for his invention of an improvement in the manufacture of soap.—Sealed 17th September—6 months for inrolment.

To William Mason, of Brecknock-terrace, Camden Town, in the county of Middlesex, engineer, for his invention of certain improvements on wheels, boxes, and axletrees of carriages for carrying persons and goods on common roads and railways.—Sealed 24th September—6 months for inrolment.

To Joshua Procter Westhead, of Manchester, small-ware manufacturer, for his invention of certain improvements in the manufacture of small-wares, and an improved arrangement of machinery for covering or forming a case around any wire, cord, gut, thread, or other substance, so as to render the same suitable for various useful purposes.—Sealed 24th September—6 months for inrolment.

CELESTIAL PHENOMENA, FOR OCTOBER, 1835.

D.	H.	M.	
1			Clock after the ☉ 10 m. 9 s.
	—		☽ rises 4 h. 19 m. A.
	—		☽ pases the mer. 8 h. 17 m. A.
	—		☽ sets morn.
	17	2	♃'s second sat. will im.
2	12	7	♅ in conj. with the ☽ diff. of dec. 4. 35.
3	16	9	♃'s first sat. will im.
4	14	40	☿ in sup. conj. with the ☉
	14	40	☿ in conj. with ♂ diff. of dec. 2, 2.
5			Clock after the ☉ 11m. 24s.
	—		☽ rises 5h. 36m. A.
	—		☽ passes the mer. 11h. 24m. A.
	—		☽ sets 4 h. 14 m. M.
6	5	1	Ecliptic oppo. or ○ full moon.
7	10	58	♂ in the descending node.
8	9	12	♃ in □ with the ☉
10			Clock after the ☉ 12m. 49s.
	—		☽ rises 6 h. 53 m. A.
	—		☽ passes the mer. 2h. 13m. M.
	—		☽ sets 10h. 9m. M.
12	12	30	♃'s first sat. will im.
13	12	21	♃'s fourth sat. will im.
	12	46	♃'s fourth sat. will em.
	22	5	♃ in conj. with the ☽ diff. of dec. 3. 49.
14	9	53	☽ in □ or last quarter.
	—		Occul. κ Geminorum, im. 9h. 42m.
15			Clock after the ☉ 14 m. 2 s.
	—		☽ rises 10h. 42m. A.
	—		☽ passes the mer. 6h. 20m. M.
	—		☽ sets 2h. 55m. A.
	—		Mer. R. A. 14 h. 50 m. dec. 19. 22. S.
	—		Ven. R. A. 13 h. 31 m. dec. 8. 28. S.
	—		Mars R. A. 14 h. 31 m. dec. 14. 56. S.
	—		Vesta R. A. 10 h. 23 m. dec. 13. 23. N.
	—		Juno R. A. 6 h. 41 m. dec. 6. 36. N.
	—		Pallas R. A. 17 h. 23 m. dec. 7. 11. N.
15			Ceres R, A. 17 h. 42 m. dec. 27. 15. S.
	—		Jup. R. A. 7 h. 6 m. dec. 22, 28, N.
	—		Sat. R. A. 13 h. 38 m. dec. 7. 46. S.
	—		Georg. R. A. 21 h. 57 m. dec. 13. 18. S.
	—		☿ passes the mer. 1h. 17 m.
	—		♀ passes the mer. 23 h. 58 m.
	—		♂ passes the mer. 0 h. 57 m.
16	14	47	♀ in conj. with ♄ diff. of dec. 1. 20.
19	11	33	♃'s second sat. will im.
	14	23	♃'s first sat. will im.
	14	53	☿ greatest Hel. Lat. S.
	15	43	♄ in conj. with the ☉
20			Clock after the ☉ 15 m. 1 s.
	—		☽ rises 4h. 2 m. M.
	—		☽ passes the mer. 10h. 31 m. M.
	—		☽ sets 4 h. 43 m. A.
21	9	15	♄ in conj. with the ☽ diff. of dec. 0. 41.
	18	59	♀ in conj. with the ☽ diff. of dec. 1. 39.
22	0	17	Ecliptic conj. or ● new moon.
	15	38	♂ in conj. with the ☽ diff. of dec. 1. 32.
23	1	47	☿ in conj. with the ☽ diff. of dec. 3. 57.
25			Clock after the ☉ 15m. 45s.
	—		☽ rises 11 h. 28 m. M.
	—		☽ passes the mer. 3 h. 11 m. A.
	—		☽ sets 6 h. 49 m. A.
26	14	10	♃'s second sat. will im.
	16	17	♃'s first sat. will im.
	—		Occult. φ Sagittarii, im. 6 h. 21 m., em. 6 h. 38 m.
27	11	51	☿ stationary.
28	3	46	☽ in □ or first quarter.
	10	45	♃'s first sat. will im.
29	16	40	♅ in conj. with the ☽ diff. of dec. 4. 45.
31	10	49	☿ in conj. with ♂ diff. of dec. 1. 58.

J. LEWTHWAITE, Rotherhithe.

METEOROLOGICAL JOURNAL,

FOR AUGUST AND SEPTEMBER, 1835.

1835.	Thermo.		Barometer.		Rain in inches.	1835.	Thermo.		Barometer.		Rain in inches.
	Hig.	Low.	High.	Low.			Hig.	Low.	High.	Low.	
Aug.						Sept.					
26	63	51	29,62	29,61		10	64	44	29,45	29,32	,125
27	70	49	29,83	29,66		11	58	45	29,60	29,39	,15
28	70	50	29,99	29,91		12	60	45	29,40	29,31	,05
29	72	48	29,99	29,97		13	62	40	29,67	29,48	,275
30	79	42	29,98	Staty.		14	66	44	29,87	29,78	,075
31	70	42	30,02	29,99		15	66	53	29,84	29,73	
Sept.						16	61	45	29,73	29,72	,125
1	73	46	30,08	30,03		17	60	40	29,73	29,68	,025
2	72	42	30,11	30,08		18	62	37	29,73	29,64	,025
3	73	40	30,05	29,91		19	64	49	29,60	29,50	,075
4	76	50	29,81	29,79	,225	20	63	54	29,74	29.58	,55
5	74	57	30,01	29,82	,025	21	57	51	29,83	29,67	,075
6	73	51	30,05	30,01		22	69	52	29,59	29,48	,3
7	73	55	30,02	29,91		23	64	54	29,70	29,60	,1
8	69	45	29,77	29,57		24	61	51	29,89	29,75	,3
9	60	48	29,68	29,64	,325	25	62	44	29,83	29,91	

Edmonton. CHARLES HENRY ADAMS.

Latitude 51° 37 32 N.
Longitude 3 51 West of Greenwich.

THE
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CONJOINED SERIES.

No. XLIV.

Recent Patents.

To Isaac Dodds, *of Horseley Iron-works, in the parish of Tipton, and county of Stafford, engineer, for certain improvements in machinery for cutting and shaping wood and other materials, part or parts of which machinery are applicable to other useful purposes.*—[Sealed 29th January, 1835.]

These improvements in machinery for cutting and shaping wood and other materials, part or parts of which machinery are applicable to other useful purposes, consists in certain mechanical arrangements designed for the purpose of guiding saws, or other cutting instruments in machinery employed for cutting and shaping wood, or other materials, into various forms; or in shifting or sliding the bed or carriage upon which the wood, or other article to be cut, is fixed, in order that such saws, or other cutting instruments, may be so brought into operation upon the wood, or other material intended to be cut; or that the wood, or other material, may be so brought under the operation of the saws, or other cutting instruments, as to cause the desired forms to be given to the material by the action of the saws, or other cutting instruments, when put into operation. In order to render these improvements perfectly evident, the Patentee represents his novel arrangements of machinery in the several figures of Plate V., and under several modifications suited to different purposes, that is, to the cutting of different shapes in wood, and other materials.

Fig. 1, is a side elevation of a machine for cutting irregular forms out of planks, boards, or blocks of wood, or other material; fig. 2, is a plan or horizontal view of the same; and fig. 3, is a vertical section, taken transversely through the machine nearly in the plane of the saws; the respective letters of reference pointing out the same parts in these three figures.

This machine is designed to cut out and produce the first rough forms in wood for gun stocks, staves for casks, curved pieces for the felloes of wheels, backs, arms, and other irregular-shaped parts of chairs and sofas, ships' timbers of various descriptions, and for a great variety of other irregularly-shaped pieces required in carpentering, cabinet-making, coach and boat building, patten-making, and many other purposes: A, A, denotes the side standards of iron, which support the machinery, mounted upon foundations of stone, iron, timber, or other substantial base; B, B, are the side bars, railways, or ribs of the framing, on which the carriage C, moves longitudinally. This framing B, supporting the carriage C, is mounted upon transverse bars, railways, or ribs D, D, which allow of its moving laterally, the rails D, being fixed upon pillars or walls resting upon the foundation; E, E, E, represent three pieces of timber intended to be cut into irregularly-curved shapes; these pieces are fixed upon the carriage C, by clamps, or other fastenings, and are supported by transverse blocks or bearers beneath, resting upon the rails of the carriage. These three pieces of timber are so fixed upon the carriage, as to correspond with the situations of three vertical saws F, F, F, mounted in a vibrating frame G, G; which saws are intended to act simultaneously in cutting the three pieces of timber into similar curved shapes by a parallel action.

The vibrating saw frame G, slides up and down vertically upon perpendicular guide rods H, H, fixed to the side standards, and is actuated by means of a rod I, connected to it, and to a crank K, below. The crank shaft L, which is the main driving shaft of the machine, is driven by a pulley and band leading from any first mover. On this crank shaft there is an eccentric M, to which is attached the rod N, carrying a click O: this click falls into the teeth of the ratchet wheel P, fixed on the end of the axle or shaft Q.

A long pinion R, on the shaft Q, takes into the teeth of a rack in the under side of the horizontal bar S, which bar is affixed to the carriage C: hence it will be perceived that by giving rotary motion to the ratchet P, and its axle Q, the carriage C, with the planks, boards, or blocks of wood, or other material placed thereon, will be made to advance slowly against the edges of the saws.

On the side of the carriage is to be affixed the pattern or model T, which shall direct the cutting or shape to be given to the planks, boards, or blocks, by the action of the saws. The manner of effecting this will be best explained by the horizontal view of the machine, fig. 2.

A friction roller, or any other smooth surface intended to operate as a wiper, is mounted in one of the side standards of the machine at V; and two weighted levers W, W, are mounted on the opposite side, carrying anti-friction rollers X, X, which press against the sides of the frame B, B, for the purpose of forcing up the frame B, and the carriage C, so that the model T, shall, as the carriage advances, continually bear against the wiper V.

Having now explained the construction of the several parts of this machine, a very slight description of its mode of operating will be sufficient to render the improvement evident.

The rotary motion of the crank shaft L, driven by the band and rigger, causes the vibrating frame G, G, carrying the saws F, F, F, to move rapidly up and down upon its perpendicular guide rods H, H; at the same time the rotation of the eccentric M, gives such reciprocating movements to the rod N, and click O, as to cause the ratchet wheel P, to be gradually driven one tooth every rotation of the crank. This rotary movement of the ratchet wheel P, with its axle Q, and pinion R, gradually advances the carriage C, upon the longitudinal railway B, B, bringing forward the planks, boards, or blocks E, E, E, against the cutting edges of the vibrating saws F, F, F.

This simple progressive movement of the carriage would cause the saws to slit the planks, boards, or blocks, in longitudinal right lines; it is, however, to be remembered, that the frame B, B, slides upon the transverse railway D, D, and that as the carriage C, advances, its lateral position is determined by the inequalities on the edge of the model T, which is pressed against the wiper V, by the weighted levers W, W: it follows, therefore, that as the carriage C, with the planks, boards, or blocks, advances, it will, with the frame D, D, be made to slide laterally to and fro, in obedience to the form of the guide or model T; and, consequently, that the saws, as they vibrate, will cut the material under operation in certain curved lines in perfectly parallel coincidence with the fixed pattern or model T.

It remains now to explain the manner in which the blades of the saws are at all times made to assume positions coincident with the direction of the cutting lines, that is, parallel to the face or figure of the model.

The clips or hilts *a*, *a*, into which the ends of the saw blades F, F, F, are inserted, are attached to the top and bottom rails of the vibrating frame G, G, by means of pivots or centres, as shown in the detached view of one of the saws at fig. 4; which mode of attachment allows the blades F, of the saws to turn horizontally, for the purpose of assuming positions which shall at all times be parallel with the operating part of the surface of the model T. In order to preserve this parallelism of the saw blades, a small tail lever *b*, *b*, extends from the hilts of each saw; and these tail levers are all connected by a rod *c*, to one end of a parallel lever *d*, turning on pivots fixed in the rails of the saw frame. The reverse end of these parallel levers are connected to arms *e*, *e*, extending from a sliding piece *f*, inserted into a long slot in the side frame of the carriage.

It will now be perceived by thus connecting the saws to the sliding piece *f*, that as the carriage C, is made to slide to and fro laterally by the irregular surface of the model T, the saw blades will be turned to different angles, at all times preserving their correct cutting positions, and perfect parallelism with the model.

Having explained the construction and operation of the several parts of the improved machine for cutting of different shapes in wood, and other materials, into various forms for useful purposes, the Patentee desires it to be understood, that he does not intend to claim as new all the parts of the said machine, as many of those parts are common to other sawing machinery, neither does he intend to confine himself to the particular arrangement shown in the foregoing figures; but he claims as the peculiar feature of novelty invented by him, the connecting (with a sawing machine for cutting and shaping wood, and other materials), first, the adaptation of the transverse railways, or ribs, D, D, upon which the frame, with the material to be cut, may be slidden laterally. Secondly, the longitudinal railways, or ribs, B, B, upon which the carriage for conducting the articles to be cut is gradually advanced to the saws. Thirdly, the attachment of a model or pattern T, for the purpose of determining the forms of the pieces to be cut by the action of the saws; and, fourthly, the manner of mounting the saw blades, so as to enable them to turn into the correct cutting lines.

The machine for cutting grooves, mortices, and tenants, and which may also be employed for plaining small surfaces, is represented at fig. 5, a side elevation, and fig. 6, a plan or horizontal view: A, is a rigger, affixed to a rotary shaft, carrying a crank B; to this crank is connected a rod C, which at the reverse end is attached to the sliding carriage E, holding the cutter: D, D, D, D, are four cranks or levers, on the ends of which the frame H, is mounted. This frame H, is formed with grooves or ribs within, for the carriage E, to move to and fro upon: G, is the frame supporting the machinery, which rests upon the foundation; I, is a vertical table, to which the article intended to be cut must be made fast. This table is intended to slide in two directions, for the purpose of adjustment, to suit the dimensions of the hole intended to be cut; which adjustable movement is effected by screws. The table I, may be brought to any desired angle by means of a quadrant rack, as shown by dots, for the purpose of cutting the mortices or grooves at any desired angle of obliquity.

The rotary action of the shaft and crank B, gives the reciprocating movement to the cutters fixed in the carriage E, by sliding the carriage to and fro on the grooves or ribs of the frame H.

In order to increase the depth of the groove or recess to be cut in the article placed upon the table I, the carriage H, mounted on the cranks or parallel levers D, D, D, D, must be lowered. This is done by a click connected to an excentric on the crank shaft B, the end of which click takes into a ratchet wheel L. The axle of this ratchet wheel carries two pinions M, M, which respectively take into two segment racks or toothed wheels F, F, on the shaft or axle of two of the cranks or parallel levers D, D. It will now be perceived that by the gradual rotary movement of the ratchet wheel L, the frame H, upon the cranks or parallel levers D, D, will be gradually lowered to such an extent, as shall cause the sliding cutter to cut the mortice or groove to any required depth: K, is a balance weight attached to an arm extending from one of the parallel levers D, by means of which the frame and carriage is balanced in whatever position it is placed.

The Patentee proceeds to state, that he sometimes applies, in place of the guide frame H, and parallel levers D, D, a parallel motion shown detached at fig. 7, which is peculiarly adapted to the machine last described, for cutting at right angles to the face plate or table. This parallel motion carries the cutting point *f*, at all times perfectly parallel to itself, by means of the peculiar arrangement and exact proportions of the levers *a, b, c, d, e*, shown in fig. 7, and also by outlines in the situation in which it would be applied at fig. 5.

Instead of the chisel-pointed cutter last described, a key-hole saw for cutting wood is sometimes inserted into the socket of the carriage E, fig. 5, or into the socket *f*, fig. 7, and then give to the chuck plate in front of the table on which the wood to be cut is fixed, such a rotary or reciprocating motion, or any other irregular movement, by hand or by machinery, as shall enable me to cut out shapes or forms of various descriptions.

The parallel motion last described may be applied to other useful purposes. For instance, to steam-engines commonly denominated "vibrating pillar engines," as it is capable of communicating an extra parallel motion, by attaching the bars, links, or levers *c*, and *d*, to engines of that description, for the purpose of working the rod of an air pump, or other pump, attached at *f*.

Fig. 8, represents, in elevation, an apparatus for cutting the eyes of spade, shovel, or saw handles; fig. 9, is a plan or horizontal view of the same: *a*, is the base or bench; *b*, a standard, supporting an axle driven by a rigger or pulley. At the end of this axle a crank *c*, is fixed, to which is attached a rod *d*, connecting the crank to a sliding bar *e, e*. This bar moves in slots in standards *f, f*, (one of which is shown in the front view, fig. 10.) To this sliding bar *e*, the cross heads *g, g*, of a saw *h*, are affixed: these cross heads are also connected to the square guide rods *i*, *i*, which slide through square apertures in the pulleys *k*, *k*, turning on hollow bearings in the standards *f*, *f*. A block or poppet head *l*, is fixed on the bench *a*, and a large bush passes through it, one end of the bush carrying a pulley *m*, and the other end receiving the chuck plate *n*, on which the chuck with the piece of wood *o*, to be cut is fixed in the ordinary way. The saw *h*, is attached to the two guide rods *i*, *i*, and stretched by a right and left-handed screw *q*. The saw *p*, having been passed through a hole previously perforated in the shovel head or piece *o*, intended to be cut, rotary motion is given to the crank, which causes the saw to move reciprocally in a horizontal direction. The piece to be cut may, during the action of the saw, be turned round by hand, so as to bring the saw to act upon it in any desired way, or it may be driven round by giving to the pulleys slow motions by racks, screws, or any other convenient means which are well understood by mechanics.—[*Inrolled in the Rolls Chapel Office.*]

Specification drawn by Messrs. Newton and Berry.

To Richard Abbey, *of Walthamstow, in the county of Essex, gentleman, for his invention of a new mode of preparing the leaf of a British plant for producing a healthy beverage by infusion.*—[Sealed 21st February, 1831.]

This invention consists in preparing the leaf of the British plant, commonly known by the name of the thorn, in such a manner as to produce a kind of artificial tea, which may be sweetened and made palatable to the palate of the user by the use of milk and sugar, in the same manner as the tea in ordinary use.

The Patentee proceeds to describe his invention in the following manner: firstly, he gathers the leaves of the thorn, observing, that he prefers the leaves of that species of thorn generally known by the name of the hawthorn, which ought to be carefully picked over and examined, in order to extract any dirt, dead leaves, or other extraneous matter that may get mixed with the leaves; after which he washes and rinces them well in clear water, and taking them from thence in their moist state, he steams them in a common kitchen steamer until they are in a limp and flabby state, when they are transferred to an iron plate, which may be heated to any temperature desired, and upon which they are quickly dried, and are then ready to use in the way in which tea is generally made, and may be sweetened to the taste of the user, as before described.—[*Inrolled in the Petty Bag Office, August*, 1831.]

To WILLIAM WILLIAMS, *of Pembrey House, near Llanelly, and* THOMAS HAY, *of Kidwelly Tin-works, both in the county of Carmarthen, gentlemen, for their invention of improvements in preparing certain metals, applicable to the sheathing the bottoms of ships, and other purposes.*—[Sealed 17th April, 1834.]

THIS invention for preparing certain metals for sheathing ships' bottoms, and other purposes, consists in preparing zinc or spelter, by covering thin plates of laminated zinc or spelter with a very thin coating of block tin, which may be done in a similar way to that by which plates of iron are generally tinned, and the zinc plates prepared in the aforesaid manner by tinning, may be used instead of the copper plates, usually used for the purpose of sheathing ships' bottoms. It should be observed, however, that the zinc plates may be tinned on both, or only on one side, as may be thought most convenient. The zinc plates so prepared may also be used, instead of lead or copper, for covering the roofs of houses, or for the water spouts or gutters of houses; in any of which applications, the zinc will be preserved from oxydation, by the effect of the weather upon roofs or gutters, or from the corrosive effects of the salt water by the tin coating, if used for sheathing of ships' bottoms.

The Patentees proceed to state the manner in which they prepare the zinc plates, by tinning them, which is performed in the following manner:—They first, however, observe, that the plates of laminated zinc, which they prepare according to their invention, are now generally imported from abroad, and they are brought to this country rolled to various thicknesses and different dimensions; and the tin which they use for tinning the plates of zinc, is the same as that which is in common use for tinning iron plates. The zinc plates have a very smooth surface when they are brought first into this country, which smooth surface is given to them by the operation of laminating or rolling.

Now, the manner of preparing the zinc plates is, firstly, bypickling them in a weak solution of muriatic acid, or sulphuric acid, and water. The Patentees here observe, that sulphuric acid will answer the same purpose as the muriatic acid, though not quite so well; and that the strength of the solution is not of any material consequence, as it may be made as strong as one measure of acid to about twelve measures of water; or it may be used as weak as one of acid to twenty parts of water, the solution in either of these proportions answering the purpose of cleaning the plates; but the Patentees state, that they find a solution of the strength of one part of acid to sixteen of water to answer the purpose best, by keeping the zinc or spelter plates immersed in the solution from two to five minutes, according to the state of cleanliness of the plates, and the strength of the solution. When the plates are taken out of the pickle, they are laid upon a bench, and both the surfaces well scoured with a wisp of hemp, and coarse sand; both of the surfaces must be scoured, for the purpose of cleaning them, even though it may be intended to tin only one side. After being well scoured, the plates should be washed in water, for the purpose of removing any grains of sand, and cleansing them from any acid which may be still remaining upon their surfaces: after which, when the water is wiped off, they are immersed in a rectangular cast-iron vessel, containing palm oil, or melted tallow, which is heated by a furnace placed beneath; which furnace has a sliding damper in the flue, for regulating the draft of air through the fire, and consequently the heat of the fire may be kept at any temperature required; which heat must be uniform and steady, and at a temperature lower than that which is requisite to melt block tin. After the zinc plates have been immersed in the heated oil or tallow from two to five minutes, they will become heated, and the oil or tallow will get into very close contact within the surface of the zinc plates, which is very requisite for causing the tin to adhere firmly to them.

The Patentees here state, that they resort to two different ways of tinning the plates which have been so prepared; and one of these ways is, by dipping the prepared plates of zinc into melted tin, in a similar manner to the process of tinning plates of iron. The block tin must be of a very good quality, and kept in a melted state in a dipping trough or cistern, constructed of cast or plate iron, set in brickwork, with a furnace similar to that used in the oil cistern beneath, and with a damper in the flue for regulating the temperature; the heat should, by means of the damper, be kept very regular and uniform, and at a temperature sufficient to keep the block tin in a state of complete fusion, but not much higher than the fusing temperature.

A quantity of palm oil (about three inches deep) should be kept floating on the top of the melted tin, and the depth and length of the trough must be sufficient to admit of the whole plate of zinc being immersed edgeways at once.

The immersion of the laminated zinc plates into the melted tin, is performed in a similar manner to that practised in tinning iron plates. The zinc plates must be gradually let down into the trough containing the melted tin with a steady descending motion, and then with a similar motion they must be immediately drawn up, without allowing them to stop in the melted tin any longer than is absolutely necessary to allow the tin to take firm hold of the zinc, because the fusing temperature of the zinc is so near that of melted tin, that either the zinc would melt, or it would form an alloy with the tin, and thus frustrate the design which is proposed, by tinning the plates, and therefore would not be so well qualified to resist the corrosive effects of the salt water: the time, therefore, which the zinc should remain immersed in the tin during the operation of dipping, must be decided by the discretion of the workman, who will (if he has been accustomed to dipping iron plates) find out how to suit the time of immersion to the zinc plates, so that when he withdraws the zinc from the melted tin, its surface may be completely covered with a brilliant continuous coating of block tin of a suitable thickness, neither thicker nor thinner than is intended to remain thereon: which latter circumstance constitutes the principal difference between the Patentees' improvements, and the ordinary mode of tinning iron plates, because the iron plates, according to the ordinary mode, are allowed to remain immersed in the tin long enough to acquire a thicker coating than it is intended shall remain on them; the surplus tin being afterwards removed by immersion in hot palm oil or melted tallow, which is kept heated to a temperature sufficient to melt tin; and, therefore, by the iron plates being kept immersed in the oil a suitable time, a certain quantity of the tin will fuse and drain off, and collect at the bottom of the cistern, and only that thickness of tin is allowed to remain on which it is desired to have. This mode, however, cannot be practised with regard to zinc plates, because that metal will not bear sufficient heat to fuse the tin to effect the draining off.

Immediately after the plate of zinc is withdrawn from the trough or cistern containing the melted tin, with the tin coating upon its surface, it is again immersed in another cistern containing heated palm oil or melted tallow; the temperature of the palm oil or melted tallow in this trough being kept very near the temperature of tin in a state of fusion, which temperature is rather higher than the oil or tallow in the cistern in which the plates were immersed previous to the tinning process.

The new tinned plate of zinc is left in this second cistern of heated palm oil for about one minute, for the purpose of fixing the tin upon the zinc, and giving the plate a more brilliant and even appearance.

When the plate of tinned zinc is again and finally withdrawn from the last-mentioned trough or cistern of oil or tallow, it is laid flat upon a table, and its surface is rubbed over with hemp and dry bran whilst it is cooling, for the purpose of removing all the superfluous oil or grease from the tinned surface. This last-mentioned operation is performed on both sides, first upon one side and then upon the other, so as to give the surfaces a perfectly clear and bright appearance; after which the plates are ready for any use to which they may be applied, such as sheathing ships' bottoms, or covering roofs, or making gutters or spouts.

The Patentees proceed to state, that in case it should be required that the laminated zinc plates be tinned on one side only, that side which it is intended should not receive the tin should be covered over with a thin coating of hot quick lime, slacked, and then mixed with water till it gains the consistency of cream, or else with lamp-black and sise mixed to the consistency of paint: the coating must be in either case spread on with a painter's brush, and care must be taken that the whole of the surface of that side which is not to receive the tin be evenly covered over with the aforesaid preparation. When the plates have been rubbed dry from the water of the washing process, which comes after the process of pickling the plates in the acid solution, it will be found that the preparation of lime or lamp-black will effectually repel the tin from adhering to that side which is thus coated.

The Patentees go on to describe the second mode of performing their improvements in preparing laminated zinc plates by coating the same with tin, which is performed in the following manner:—Immediately after the plate of laminated zinc is taken out of the trough or cistern of palm oil or tallow, this being its first immersion, instead of dipping it into the cistern containing the melted tin, as in the foregoing process, it is to be laid upon a flat cast or wrought-iron table; which table is heated by means of a coke or coal fire made in a fire-place underneath the table, the flue of which fire-place is furnished with a damper to regulate the heat. The plate of zinc being laid flat upon the table, as before mentioned, will be heated to a temperature sufficient to melt tin. This table is nearly of the size of the plate of zinc, and has a gutter running all round the margin to receive the overflow of oil or tallow, or melted tin, which is to be poured over the surface of the zinc plate. The melted tin for this purpose is contained in a cistern placed at one end of the table, which trough also has a fire beneath it similar to the dipping trough before mentioned, the melted tin which it contains being also covered over with a suitable depth of palm oil or melted tallow.

The operation of applying the tin to the surface of the zinc, is begun by bathing the zinc with oil or tallow, that is, by taking up a ladlefull of the oil or tallow which floats on the surface of the melted tin, and pouring it on the zinc plate, and repeating this operation till the plate is heated to the proper temperature. The oil as it is poured on will run over the surface of the zinc, and from thence into the gutters which conduct it back again to the cistern: then a ladleful of melted tin and oil is poured over the plate, which, as it runs over the plate, is distributed equally over the surface with a hempen brush, to cause it to adhere to the zinc. The surplus tin which flows off runs into the gutters, and from thence into the cistern again. The tin is to be poured out and rubbed with the brush all over the surface of the zinc, until the plate is perfectly coated with tin, when it is turned over; and the other side undergoes the same operation: after which, the tin coating on both sides is laid smooth, by drawing the plate between two hempen brushes; which brushes act upon both sides at once, and render the tinned surfaces very even and smooth. For the purpose of brushing both sides at once, a wooden plank, of the same width as the zinc plate, is placed at one end of the table. One of the brushes is fixed at the end of the plank; and when the zinc plate is finished tinning, it is lifted off the iron table on to the plank, and drawn by a pair of tongs over the hempen brush: the plate, whilst being drawn over, rests with its whole weight on the brush, and thus levels and smoothens the tin on the under side; at the same time, a man holds a similar hempen brush firmly on the uppermost tinned surface, and thus both sides are made even by one operation; and after the plate has been drawn between the two brushes, it is placed flat upon a wooden table, where it is left to cool; and when the tin has become fixed, the plate is removed into a bran trough, and there rubbed with dry bran, for the purpose of removing the oil, or other grease, as in the first described operation of dipping. If it is desired to tin only one side of the plate, the side which is turned downwards on the iron table may be coated with lime-wash, or lamp-black and size, as in the other process.

The Patentees state, in conclusion, that having now described their invention, they declare that their improvements consist in "preparing zinc and tin, so as to cover the surface of laminated zinc on one or both sides, with continuous coating of tin, for the purpose of rendering such zinc applicable to sheathing ships' bottoms, and for gutters and water-spouts for roofs."—[*Inrolled in the Inrolment Office, October*, 1834.]

To JOHN GEORGE BODMER, *of Bolton-le-Moors, in the county of Lancaster, civil engineer, for his invention of certain improvements in steam-engines and boilers applicable both to fixed and locomotive engines.*—[Sealed 24th May, 1834.]

THE improvements specified under the title of this patent being of considerable novelty and importance, we have thought it necessary to give the full particulars of the invention in the Patentee's own words, rather than present our readers with a more condensed description.

This invention consists of several novel features in the construction of such engines and boilers; and, first, as regards the engines in the employment of two pistons in one cylinder moving in opposite directions, each piston working a separate crank on the same shaft, by which arrangement the power applied to the shaft is balanced or equalized; for as one piston forces its crank one half of a revolution, the other piston pulls its crank the other half, thereby communicating a rotatory motion to the shaft without strain or stress upon its bearings: and further, that as the expansive force of the steam acts upon the pistons, and through them upon the cranks alone, it is evident that there will not be any strain exerted upon any part of the framework or foundation of the engine. By employing two pistons the power is doubled, and therefore two cranks, each of four inches radius, would exert the same power upon the shaft as one crank of eight inches; and the speed of the engine may be doubled without causing more wear and tear in the pistons and cylinders, than in engines of the ordinary construction when working at half the speed; and owing to the shortness of the stroke, and increased size of the steam-ways, great speed can be obtained without diminishing the power of the engine.

The second novel feature of my improvements in steam-engines, consists in compensating or balancing the pressure exerted by the elastic force of the steam upon the slide valves, by which I am enabled to extend the area of the steam passages, and, consequently, the surfaces of the valves, to any dimensions required, without increasing the friction in the same proportion.

The third improvement consists in adapting segment guides for the bearings of the crank shaft to move in; by which means the pistons and slide valves are confined to work within their proper space of action without variation, in whatever position the crank shaft may be.

The fourth improvement consists in the mode of constructing and mounting double bearings for the crank shaft, between which the running wheels are placed; and also in connecting the carriage springs with those bearings, and the frame of the carriage, in such a manner, that the pressure or stress on the two bearings will be compensated or balanced one with the other: by which arrangement, the weight or pressure of the carriage is prevented from acting upon the cranks.

The fifth improvement consists in an improved method of expanding the metallic packings of pistons, and in preventing the wear of the pistons and cylinders when placed in a horizontal position.

The sixth improvement consists in a method of increasing the speed of a locomotive engine, while it is passing along a horizontal railway, without increasing the velocity of the crank shaft.

Fig. 1, Plate VI., is a vertical section, taken longitudinally through the engine. Fig. 2, is a plan or horizontal view of the same, complete. Fig. 3, is a longitudinal section, taken through one of the cylinders, pistons, and slide valves, on an enlarged scale. Fig. 4, is a transverse section and end view of the same: A, A, are the cylinders, each cylinder having two pistons, B, and C, working within it, with their rods D, and E, passing through stuffing boxes in the covers F, G: H, is the slide valve, working in the box or steam chamber I, to which is connected the steam pipe K, leading from the boiler: *a*, *b*, and *c*, are the steam-ways of the cylinder, and are alternately induction and eduction passages, according to the position of the slide valve, which is hollow, and forms the exit way of the steam discharged to the exhauster or chimney through the passages or ways *d*, *e*. Supposing the pistons and valves to be in the position shown in fig. 3, that is, with the passages *b*, and *c*, open to the interior of the slide, by which the steam makes its exit, the passage *a*, would be open for the admission of the steam into the cylinder, when the steam would first insinuate itself between the pistons B, and C, and there exerting its expansive power, would force the pistons apart, or in the direction of the arrows, toward the ends. When the pistons have arrived at the ends of their strokes, the slide valve will have moved in the direction of the arrow opening the aperture *d*, to the steam-way *a*, which will now become an exit passage; and at the same time the ways *b*, and *c*, towards the end of the cylinder, will have become open for the admission of steam into the interior, the elastic force of which will now move the pistons again into the middle of the cylinder, as shown in the figure. By this time the valve will have been again changed, and the passages or ways situate as before. It will be seen that the exit way *d*, is sufficiently large to be always open to the discharge passage *e*.

The manner or method of compensating or balancing the pressure of the steam upon the slide valve, is best shown in figs. 3, and 4, and is effected by the following means:—To the valves H, are connected, by means of the rods or links L, L, the two steam-tight pistons M, M, which are constructed so that the expansive force of the steam presses their sides outward in close contact with the small cylinders N, N; the sides of the pistons M, being made elastic by the thinness of the metal, which has three or more slits or saw gates cut in it to about two-thirds of its depth; but any other description of steam-tight pistons will do equally well. The pistons M, M, work in the two small cylinders N, N, fixed on to the valve box or steam chamber I, over the opening *f*, *f*, formed in it. The outer end of these cylinders N, N, are open to the atmosphere. The steam admitted into the chamber I, exerts its expansive force upon the surface of the slide valve H, and also (through the openings *f*, *f*,) upon the pistons M, M. It is, therefore, evident, that the force of the steam exerted upon the pistons M, M, will, through the links L, L, have a tendency to draw the sliding surface of the valve H, from contact with the surface of the cylinder, and, therefore, relieve that surface from the pressure of the steam by compensating it with the force exerted upon the pistons. And as the area of the pistons M, M, are somewhat less than that of the surfaces of the valve H, in contact with the cylinder, the valve will always be kept in contact with it, and at a pressure dependant upon the area of the pistons M, M. It will be evident, by thus relieving the slide valve from the pressure of the steam, the induction and eduction passages of the cylinders may be enlarged to any desirable extent, without regarding the friction caused by the pressure of the steam upon the consequently enlarged surfaces of contact, as that can be compensated by the area of the pistons M, M; and therefore the engine may be worked at a very great speed, without being cramped or confined by the want of a full supply of steam, as is the case with engines of the ordinary construction.

In further explanation of the working of the slide valve, it is necessary for me to state, that when the slide valve is moving to change the induction and eduction passages *a*, *b*, and *e*, at the precise moment, the solid parts of the valve cover those apertures; the steam in the cylinder will exert its power in conjunction with that upon the pistons M, M, to force away the valve from contact with the cylinder; but this removal is prevented by the following means:—The pistons M, M, are directed in their action by the cylindrical parts *g*, *g*, working in the guides *h*, *h*, and the pins *i*, *i*, which work in hollow-adjusting screws *k*, *k*, passed through female screws in the top part of the cylinders N, N. These screws *k*, *k*, are furnished with tightening nuts, and are so adjusted, that at the precise moment the solid parts of the slide valve cover the steam-ways *a, b, c,* the shoulders *l, l,* of the pistons come in contact with the end of the screws, the action of the pistons M, M, is therefore stopped; consequently, at this moment, the whole force of the steam in the box I, is exerted upon the valve, the abutting of the pistons against the adjusting screws preventing the compensating or balancing of its power for that moment.

I would further remark, that if it should be found necessary to stop the engine, or reverse its motion suddenly, and this should happen at the very moment that the solid parts of the slide valve cover the steam-ways *a, b, c,* then the velocity of the running wheels of a locomotive carriage, or the fly-wheel of a stationary engine, would cause the pistons to compress the steam within the cylinder, it being prevented from escaping out of it: the resistance would then be so great, that if the steam were not allowed to escape, some parts of the machinery must give way, and probably be destroyed. To obviate this evil, I allow the slide valve to give way a little, as soon as the compressed steam in the cylinder has power to overcome the force of that in the chamber I. This is effected by forming the connexion between the links L, L, and the slide valves H, H, by a short slot, through which the connecting pin is passed, as shown at *m, m,* in fig. 3. This slot allows the steam compressed in the cylinder to force up the slide valve, and make its escape, thereby preventing the breaking of any part of the engine or machinery.

Having now described the action of my first and second improvements, I shall proceed to show how I apply the power exerted by the working-pistons upon the cranks to propel a locomotive carriage, or actuate machinery. The ends of the piston rods D, D, work between V-shaped guides O, O, and are connected to the rods P, P, in the usual manner. The other ends of these rods are connected to the cranks Q, Q, on the shaft R: the piston rods E, E, also work between guides S, S, and their extremities form the plungers of the hot water pumps T, T. Upon these piston rods are also formed the cross heads U, U, to the ends of which are connected the rods V, V; these are connected to the arms or cranks W, W, on the shaft X, mounted on bearings in the framework. To the cranks or arms W, W, are connected the rods Y, Y, leading to the other cranks Z, Z, upon the shaft R, by which means the power exerted by the pistons will be communicated to the crank shaft in the manner already mentioned.

My third improvement on locomotive steam-engines, viz. the segment guides to the bearings of the crank shaft, is shown in fig. 1, and in detached views at fig. 5: *n, n,* are the segment guides, firmly fixed to the framework of the carriage: these guides have grooves formed in their inner sides, in which the ribs *o, o,* on the bearing pieces *p, p,* slide (see the detached fig. 6). The pieces *p, p,* support the weight of the carriage upon the bearings of the crank shaft R. It will be perceived that as the carriage descends by any extraordinary weight or sudden jerk, the guides *n, n,* and also the cylinders and pistons, will descend with it; and that from the peculiar shape of the segment guides, the same distance will at all times be preserved between the ends of the piston rods D, D, and the centre of the crank shaft, and also between it and the pins of the crank arms W, W; the segment form of the guides being part of a circle, the centre of which is the connecting pins of the crank arms and piston rods. By these means the piston and slide valves are obliged to work within their proper sphere of action, as before stated.

My fourth improvement, viz. the mode of connecting and mounting the double bearings of the crank shaft, is shown in figs. 1, and 2, and also in detached views at fig. 6, (see also figs. 11, and 12.) The weight of the carriage and engine is supported by the rods *q, q,* the lower ends of which are placed in sockets *r,* formed on the sides of the pieces *p, p,* which rest upon the bearings of the crank shaft. These rods are passed through guides on the springs, and their upper ends are furnished with adjusting screws, and connected to the lever *s.* To this lever are suspended by a pin two other levers *t, t,* to the ends of which are connected the rods *u, u.* These rods embrace and support the springs *v, v,* and to the ends of the springs are attached the links *w, w,* which are connected to the frame of the carriage, and by these means the carriage and engine are suspended.

By this mode of suspending the carriage and springs, there cannot be any more weight or strain exerted upon the bearing on one side of the wheel than the other, as the weight is compensated or balanced between the two; and further, to prevent any unequal strain or stress upon the bearings, caused by the carriage or the segment guides being out of a perpendicular line with the centre of the crank shaft, I form the upper parts of the collars or pieces *x, x,* in which the shaft revolves, partly of a convex spherical shape, as shown in the detached fig. 6; the upper parts of these pieces fitting into corresponding concave sockets or recesses on the under side of the bearing pieces *p, p.* By these means the pieces *x, x,* will adjust themselves in the manner of a ball and socket joint, so as always to have a proper and equal bearing upon the crank shaft.

The bearings may be supplied with oil, or other lubricating material, by means of a small reservoir and roller running in contact with the shaft, as shown in the detached figures.

My fifth improvement is shown in the detached views figs. 7, and 8. Fig. 7, is a sectional plan view of my improved piston. Fig. 8, is a transverse section taken through the same. The solid parts of the piston are composed of two halves *a*, *a*, fitted upon the end of the piston rod *b*, by a double cone, and secured by screw bolts, which fasten the two halves together: *c*, *c*, are metallic rings, one of which is shown detached at fig. 9. These rings turn loosely upon a cylindical part of the piston, their outer surfaces being convolute curves. On their inner surfaces are formed the segment of teeth *d*, *d*, which take into a pinion *e*, placed in a socket or recess formed in the solid parts of the piston. The outsides of these convolute rings are embraced by what may be called circular wedges, *f*, *f*, one of which is shown detached in fig. 10. These pieces constitute the packing, and their ends are connected to the solid parts of the piston *d*, by pins at *g*, to prevent their being turned round when it is required to tighten the packing, which is done by passing a key (through the opening *h*, in the piston) into the square hole in the pinion; and on turning it in the direction of the arrow, the convolute rings will be made to move in that direction, and expand the circular wedges *f*. It will be understood that the joints of the circular wedges should not be placed in a line with each other, but should overlap, to prevent the steam from escaping through the packing of the piston. By this construction I combine the advantages of a solid piston with those constructed with elastic packing.

In order to prevent the unequal wear of the pistons and cylinders, when placed in a horizontal position, I form a groove *i*, (see fig. 11,) extending the whole length of the under side of the cylinder, part of which is only shown in section in this figure; into this groove is accurately fitted a rod of hardened steel *k*, and furnished with adjusting screws *l*. Another groove, of a dove-tailed shape, is formed in the piston, or its packing, into which is fitted another piece of steel *m*, which bears upon the former, and supports the piston. Should these surfaces wear by the friction, the rod *k*, can be readily brought up by the adjusting screws. I would here remark, that as this groove is formed by a planing machine, I prefer planing the whole of the interior of the cylinders instead of boring, as I consider a much truer cylindrical surface can be obtained by planing than by boring.

My sixth improvement, viz. the improved method of changing the speed of the carriage when running upon horizontal railways, is represented in vertical and longitudinal sections, figs. 11, and 12: *a*, is the crank shaft, turning in bearings, compensated in the manner hereinbefore described; *b*, is one of the running wheels, which turns loosely on the crank shaft as its axle; *c*, is a toothed wheel, fixed upon the boss of the running wheel; *d*, is a disc, with an inside toothed rim *e*, formed upon it; *f*, is another disc (or what may be called a double crank), fixed upon the crank shaft; this disc *f*, carries two crank pins *g*, *g*, upon which revolve two pinions *h*, *h*, which gear into the toothed rim *e*, and also with the toothed wheel *c*; *i*, is a collar or bush, sliding upon the end of the crank shaft. Upon this bush is formed the disc *k*, *k*, into which are fixed two pins *l*, *l*; by means of these pins *l*, the running wheel *b*, and the disc *d*, with its inside wheel *e*, are connected, as shown in fig. 11; viz. so that the whole of the parts revolve with the running wheel, at the speed of the crank shaft. When it is desired to increase the speed, as before stated, the pins *l*, *l*, are to be drawn out of the disc *d*, by sliding the collar *i*, upon the crank shaft, by means of a lever, or otherwise; at the same time, the inner toothed wheel *e*, is prevented from revolving, by means of a break or friction band *m*, *m*, embracing the outer surface of the wheel *e*, and which is brought into contact with it by the rods *n*, *n*, and excentrics placed on the shaft *o*, *o*; and the shaft is suspended by the rod or link *p*, from the framework of the carriage. By these means, the toothed rim *e*, is gradually stopped by the friction of the break; and as the crank shaft continues to revolve, the pinions *h*, *h*, on the disc *f*, begin to turn upon their axes, from being in gear with the teeth of the now stationary wheel *e*; and as they revolve, will turn the toothed wheel *c*, and with it the running wheel *b*, at the increased speed of three revolutions to one of the crank shaft. On again releasing the friction break, which is suspended from the rod *q*, and sliding the pins *l*, *l*, into connexion with the disc *d*, the running wheels will again take the speed of the crank shaft as before.

Having now described particularly the arrangement and construction of my several improvements in steam-engines, I shall proceed to explain briefly the other parts of the locomotive-engine shown in the drawings to which my improvements are connected, and then describe some variation of the same as applied to stationary or marine engines. The cylinders A, A, are supported on the cross bars of the framework of the carriage 1, 1, 1. Upon these cross bars the boiler is also supported. The slide valves H, H, are worked by the eccentrics 2, 2, on the crank shaft R; 3, 3, are rods, leading from the eccentrics to the levers 4, 4, working on the shaft X, as their fulcrums. The other ends of these levers are connected to the rods 5, 5, which are again connected to the hand-gear levers 6, 6, from the end of which extends the rod 7, 7, to other rods 8, 8, (see figs. 1, and 2,) connected thereto by adjustable screw joints. The rods 8, 8, pass through cylindrical guides 9, 9, formed in the steam chamber I, with stuffing boxes at their ends. From the rods 8, 8, the arms 10, 10, project into the steam chamber through the opening or slot 11, and between projecting ribs 12, 12, formed on the tops of the slides H, H. By these means the slides are worked at the required periods, and by the hand gear; the engineer stationed at the platform 13, 13, fig. 1, can reverse the motions or stop the engine when required. The discharge pipes 14, 14, for the exit of the steam, are connected with others leading to the chimney hereinafter described.

Figs. 13, and 14, are plan and sectional views of one method of packing the piston rods steam-tight in the covers of the cylinders, and in which the elastic force of the steam is used as an auxiliary, to prevent its escape: D, is the piston rod; F, the cover. The metallic packing consists of two parts 15, 15, placed round the piston rod, the joints on their upper flange being covered by pieces 16, 16; the whole is secured by the cap piece 17, fastened by screw bolts to the cover F. Steam is admitted through an opening into the recess of the metallic packing, and, by its expansive force, presses the packing into close contact with the piston rod, and thereby prevents its escape. Figs. 15, and 16, are plan and sectional views of another mode of packing the piston rods: D, is the rod; F, the cover; 18, 18, semicircular pieces of hardened steel embracing the piston rods, with common hempen packing placed behind them in the recesses 19, 19, and the whole is secured by the cap piece 20. Figs. 17, and 18, are plan and sectional views of another construction of pistons, in which the expansive power of the steam is made to force outward the segments of metallic packing in contact with the cylinder: B, is the piston; D, the rod; 21, 21, the segments of packing secured steam-tight between the two halves of the piston; but there is a small space left between the side of the solid parts of the piston and the packing, where the steam is admitted to force the packing outward.

If it should be desirable to communicate the power of both pistons through one end of the cylinder only, it may be done by making the rod of one piston hollow, and allowing the rod of the other to work through it, its end being furnished with a proper stuffing box.

Figs. 19, and 20, are representations of this method of communicating the power of the engine: B, and C, are portions of the pistons, connected to the ends of their rods D, E. The rod D, is formed as a hollow tube, with the cross head U, U, on its end, to which cross head rods are connected, leading to the crank shaft; the rod E, works through the stuffing box, formed in the cross head; and its end is also connected by a rod to a crank on the same shaft, as before described.

Having explained my several improvements as applied more particularly to locomotive engines, I must remark, that it will be evident the explanation of the first and second heads of my present invention are equally applicable to stationary and marine engines, and I shall therefore state briefly the mode of applying the power of a stationary engine constructed in this improved manner. Suppose the crank shaft of my locomotive-engine to form part of a main shaft in any factory (say a cotton mill), and that this main shaft is required to make from two hundred to two hundred and fifty revolutions per minute (which speed is given to them in common), by a multiplication of wheels and pinions for moving this main shaft; by my engine, no gearing would be required. A fly-wheel, of about four feet diameter, is put on the main shaft (that is, the crank shaft), and one or two cylinders, according to the power required, fixed to the wall of the building, or elsewhere; the pistons of which cylinders (either by means of a hollow piston rod, or a communicating shaft and rods, as already described,) are connected by crank rods with the main shaft, without the necessity of any toothed wheels, because the engine can be worked at a speed of two hundred and fifty, or more strokes per minute, without impeding the exercise of the full power of the steam upon the pistons.

Another feature of importance, is the facility and ease with which the power may be increased when it is wanted, merely by applying another cylinder to the main shaft; and (in cases where a loss of steam by condensation is not objectionable) a similar cylinder might even be applied to detached machinery at any distance, to which a steam pipe might conduct steam from the boiler.

The value and utility of this improved steam-engine is greatly enhanced, by its requiring but very simple and slight foundations or framework to support it, since (as has been fully stated) no stress or straining is exerted by the engine upon the foundation or framework on which it is mounted.

My improvements in boilers, applicable to fixed and locomotive-engines, consist, first, in a new or improved construction or arrangement of safety valves to be applied to steam boilers. Secondly, in the general arrangement and construction of a boiler for a locomotive engine, with its fire-place or furnace, feeding channel, ash-pits, and chimney, and also its apparatus for regulating the draft caused by the exit steam. Thirdly, in improvements in the arrangement or construction of boilers for stationary or marine engines.

My first improvement in the boilers is shown in fig. 21, which is a vertical section taken through part of the boiler and safety valve: A, A, is a part of the boiler; B, is the steam pipe leading from the boiler to the cylinder C, of the valve D. This cylinder is mounted upon the cross plate E, supported by two other cylinders F, and G, fixed on to sockets or flanges fastened to the boiler. Each of these cylinders have other valves H, and I, placed in them, and are open at their lower ends to admit steam from the boiler. The piston safety valve D, fits accurately in the upper part of the cylinder C, and is connected by the rod *a*, to a second piston K, placed below the opening of the steam pipe B, and working steam-tight; in the lower part of the cylinder, it is of a little larger area than the piston D. The steam contained in the cylinder C, between the valve D, and the piston K, exerts its elastic force against each of them; and, from the larger area of the piston K, depresses it, and by means of the connecting rod *a*, draws down the valve D, upon the shoulders *b*, *b*, as shown in fig. 21, and thereby closes the cylinder steam tight. The piston I, is connected to the rod *c*, which passes through the plate E, and its end serves as an index to the steam gauge *d*: this piston is kept down by a helical spring *e*, capable of contracting, under a pressure of from five pounds to above fifty pounds upon the square inch, without breaking. The ball valve H, is depressed, or kept in its seat, by the rod *f*, passed through the plate E, which has a lifting screw *g*, on its end: this valve is kept down upon its seat by a helical spring *h*, *h*, calculated not to give way to a pressure under fifty-one pounds upon the square inch, the extent of pressure required in the boiler. Supposing the pressure of the steam in the boiler to be only five pounds upon the square inch, the piston I, will not be affected; but as the pressure of the steam increases, the piston I, will rise in the same proportion, the spring *e*, giving way; and when the pressure exceeds fifty pounds per inch (say fifty-one pounds), the piston I, will have risen in the cylinder G, until the opening *i*, has arrived at the groove or steam-way *k*, *k*, which leads from the cylinder to the underside of the piston K; the steam will, therefore, immediately escape from the cylinder G, along the passage *k*, *k*, and fill that part of the cylinder C, which is below the piston K, and immediately lift it, and force up the valve D, when the overplus steam will immediately escape through the opening *l*, *l*, and up the exit pipe *m*, to the atmosphere. As soon as the pressure of the steam falls below fifty pounds upon the square inch, then the spring *e*, forces down the piston I, and closes the aperture *k*, when the pressure of the steam will again exert its force upon the upper surface of the piston K, drawing down the piston valve D, and prevent the further escape of the steam; and the small portion of steam contained in the cylinder below the piston K, may be allowed to condense or escape through a very small aperture to the atmosphere. Supposing the valve I, at any time to get out of order, or not act properly, the other valve H, will act as a second safety valve, its spring *h*, giving way under a pressure exceeding fifty-one pounds upon the square inch, when the valve will rise, and allow the steam to escape up the passage *n*, to the underside of the piston K, and it will be raised, as before described. When the engineer wishes to open the safety valve D, he has only to turn the lifting screw *g*, which will release the valve H, and allow the steam to act upon the piston K, as before stated. Fig. 22, is a vertical section, taken longitudinally through my improved boiler for a locomotive-engine, with its feeding channel, fire-place, or furnace, tubular flues, ash-pit, and chimney; also the throttle valve and pipe, for conducting the exit steam to the chimney. Fig. 23, is a plan or horizontal view of the same complete.

Fig. 24, is a front end elevation: A, is the feeding channel, which may be formed with a door at its upper end; B, is the fire-place or furnace; C, C, are the fire bars; D, D, are casings or water chambers surrounding the feeding channel and furnace; E, is another chamber or part of the boiler, which is formed separate, and placed over the furnace, its bottom forming the arch of the fire-place. This part is connected to the main boiler F, F, by bolts, and has water and steam communications by means of the pipes *a*, and *b*. The chambers D, D, at the side of the fire-place, are connected by tubes G, G, in the manner shown in the detached view, fig. 25, and are braced or secured with rods and screw plates and nuts *c*, *c*, *c*. These chambers D, have also a water communication by the pipe *a**, and steam communications by the pipes *b**, *b**: H, H, H, are tubular flues, passing through the boiler in the ordinary manner into the ash-box I, upon which is fixed the chimney K. The sides of this ash-box are also furnished with water chambers *d*, and *e*, having two series of water pipes *f*, and *g*, placed across it, connecting the chambers in the way shown in the detached section, fig. 26. The water forced by one pump of the engine enters the lower chamber *d*, by the pipe *h*; and after passing along the set of pipes *g*, across the ash-pit, enters the chamber at the opposite end, and proceeds by a pipe *i*, to the boiler: the water passing from the other forcing pump enters the chamber *e*, by the pipe *k*, and after proceeding through the tubes *f*, enters the boiler from the opposite end of the pipe *l*. By these means the water becomes heated in the tubes before it passes into the boiler: L, is the throttle valve, of the ordinary construction; M, M, are the steam pipes, branching off in two directions, and embracing the boiler, and leading to the steam boxes of the slide valves of the engines, as before stated: N, is the exit pipe of the steam, leading from the engine; this pipe also embraces the boiler, and then passes up the chimney.

In order to regulate the draft caused by the exit steam in the chimney, the end of this pipe N, is formed as represented in the sectional fig. 27: K, is the chimney, which is contracted near its upper end; N, is the exit pipe, upon the end of which is placed another pipe O, of a peculiar shape, as shown in the figures: this pipe is formed with a rack *m*, on its side, the teeth of which take into a pinion *n*, on an axle mounted in bearings fastened to the chimney. The end of this axle projects, so that a key or winch handle can be placed on it, by which it can be turned, for the purpose of raising or depressing the pipe O; and as the end of this pipe is placed nearer to or farther from the contracted part of the chimney, so will the draught be regulated; and it may be completely stopped, if required, without impeding the passage of the exit steam. When it is desired to cause a draught in the chimney before the engines are at work, and no exit steam is escaping, the valve P, which is kept down upon its seat by the lever *o*, and spring box *p*, is opened by pulling the rod *q*, which will raise the valve, and allow the steam to escape directly from the boiler to the chimney. This valve P, is placed in a box connected with the exit pipe N, and is also used as a safety valve.

My improvements in boilers for stationary or marine steam-engines, consist in the improved arrangement and construction of the same to be applied to my novel construction of fire-grates, which are propelled under furnaces described in the specification of a patent granted to me by his present Majesty King William the Fourth, and dated the 24th day of May, 1834, the specification of which is duly in the Office of the Rolls Chapel in his said Majesty's High Court of Chancery (see London Journal, vol. vii. p. 57). Fig. 28, is a vertical section taken longitudinally through one of my improved boilers. Fig. 29, is a transverse vertical section of the same: A, A, is the boiler; B, B, the fire-place; C, C, the situation of the fire-bars and ignited fuel; D, is a portion of the boiler, projecting downwards at the front end, and under which the travelling grates or frames of fire bars described in the abovenamed specification enter the fire-place: E, E, are bridges, or parts of the boiler projecting into the fire-place. The sides of the boiler are connected by a series of water pipes F, F, properly secured in the boiler: G, is the man-hole;

H, the entrance to the flue. Fig. 30, is a longitudinal section of another of these improved construction of boilers. Fig. 31, is a transverse section of the same: A, is the boiler; B, the fire-place; C, the situation of the fire-bars; D, the front part of the boiler; E, E, bridges; F, F, sets of tubular flues placed in them; G, the man-hole; H, the entrance to the flue. Fig. 32, is another longitudinal section; and fig. 33, is another vertical section taken through a boiler composed of three cylindrical tubes A, B, C: the two lower ones, B, and C, are connected together by a range of water tubes D, D, placed across the fire-place, and are each connected with the upper one A, by openings at E, E, and pipes F. The ends of these boilers are formed of cast-iron pieces G, with the man-holes in them; H, are the covers, which have four ears I, I, I, I, cast on them, and are placed in their situation by passing them edgeways through two notches formed in the man-hole, and then brought up to close it from the inside, two of the ears I, covering the notches in the man-hole, as shown by dots in fig. 33, the other two serving to keep the covers in their proper places. The covers are merely held by a rod passed through the handle, or by clamps, until the boiler is filled, when the pressure of the water and steam will keep the joints tight: K, is the situation of the fire-bars and ignited fuel; L, the entrance to the flue.—[*Inrolled in the Rolls Chapel Office, November*, 1834.]

Specification drawn by Messrs. Newton and Berry.

To **Robert Beart**, *of Godmanchester, in the county of Huntingdon, miller, for his invention of improvements in machinery or apparatus for making bricks.*—[Sealed 23d December, 1834.]

This invention consists in mounting a common brick-mould on an axis at one end, so that when the mould is filled with brick earth or clay, it may be turned over on to a board placed behind the mould (the aforesaid axis acting as a fulcrum), in such a manner as to receive the brick which is pressed out by a piston, which piston constitutes the bottom of the mould while it is being filled: but the Patentee's improvements will be more clearly ascertained upon reference to fig. 4, Plate VII., which represents a longitudinal section of an ordinary brick mould, mounted upon the improved construction described by the Patentee in his specification: *a*, is the bench or table, to which the apparatus is fastened by screws, or any other convenient means; *b*, is the brick mould; *c*, the piston; *d*, the piston rod, which has a stop *e*, affixed to it, by which the piston rod is prevented from coming too far through the mould; *f*, is the axis, upon which the mould turns, which axis turns in bearings *g*; *h*, is an opening made in the bench or table *a*, in order to allow the piston rod *d*, to pass through when the mould is turned over on to the board *i*, which is placed behind the mould for the purpose of receiving the brick when it is forced out by the piston, in the manner before described.

The Patentee here observes, that the piston *c*, is made of a plate of iron, or any other suitable substance, the surface of which is covered with a piece of horse skin, with the hair on, or any other suitable material, such as woollen cloth, for the purpose of causing the clay to separate the more easily from the piston, than would be the case if the piston were to have a smooth hard surface, such as plate iron.

The Patentee says, in conclusion, that what he claims as his improvements, "consists in mounting the ordinary brick mould on an axis at one end in such a manner that it may be turned over, and the brick pressed out therefrom by means of a piston, which, at the time of filling the mould with brick earth, constitutes the bottom of the mould."—[*Inrolled in the Inrolment Office, June,* 1835.]

To MARK COSNAHAU, *of the Isle of Man, Esq., for his having invented certain improvements in apparatus, modes, or process, for converting sea or salt water, and also brackish, turbid, or impure waters, into purified or fresh water; which apparatus, modes, or processes, or parts thereof, may be applied to other purposes.*—[Sealed 20th September, 1831.]

THIS invention, like all others for converting salt, turbid, or other impure waters into fresh water, consists in certain improvements and contrivances for distilling the impure water, and condensing the vapour which arises therefrom.*

The Patentee's improvements are in principle like nearly all the others, and only consist in the improved arrangement. The improvements will be better understood by reference to the drawing, which is shown in Plate VII., at fig. 5: *a, a,* is the boiler, which is supplied by a pipe, as will be hereafter described; *b,* is the fire-place; *c,* the ash-pit; *d,* the flue; *e,* the condenser; and *f,* the pipe, which conducts the steam into the condenser: it will now be seen that, as the fire in the fire-place acts upon the water in the boiler, the steam will be made to rise up through the pipe *f,* and pass into the chamber *g,* from whence it will be distributed down the branch pipes *h, h*; and in passing down the pipes, it will become condensed by the action of the cold water in the condenser, and fall to the bottom, when it will run into another chamber *i*; from whence the condensed steam or water will be conducted by another pipe *j,* into another chamber *k,* which the Patentee calls the purifier or clarifier, which is situated just above the flue, and from which the water in the purifier receives heat sufficient to keep it at a boiling temperature; and by that means, drive off any noxious vapours, and other impurities, which will be made to rise up into the upper chamber or dome *l,* and thus pass off through the air-holes in the dome into the atmosphere. The pure water being then drawn off from the purifier by a cock, placed at any convenient place, and left in vessels to cool, when it will be found fit for use. The Patentee here observes, that as the water in the condenser becomes heated by the action of the steam in the branch pipes *h,* it may be drawn off by a cock *m,* and pass down a pipe *n,* into the bottom of the boiler; and thus, by supplying the boiler with water already in a heated state, a great saving of fuel is effected.

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* In our last number, p. 82, we gave a description of Messrs. Westrupp and Gubbins's invention, which is for the same purpose as the present; namely, converting salt, or other impure waters, into fresh: which, however, differs from the present, as it needs no further attendance than that of supplying the boiler with water.

The Patentee further observes, that cocks *o,* ought to be placed at the bottom of the boiler, for the purpose of drawing off any liquid saline or other sediment, which would otherwise prove prejudicial to that part of the boiler which is acted upon by the fire.

The Patentee states, in conclusion, that having now described his invention, and the manner in which the same is to be performed, he wishes it to be understood that he does not confine himself to the description of condenser before described, as other kinds would answer the same purpose; nor does he mean, or intend, to claim any of the parts separately, as many of them have been before in common use; but he claims the arrangement of the apparatus, which is used for the purpose of purifying salt, or other impure waters; and he also claims the application of a purifier, as hereinbefore described.—[*Inrolled in the Inrolment Office, March*, 1832.]

To JAMES LUTTON, *of Dean-street, Soho, in the county of Middlesex, chair-maker, for certain improvements in easy chairs.*—[Sealed 31st January, 1833.]

THE particular improvements in the construction of easy chairs, described under this patent, consist in forming the chair in two parts, so that the recumbent position is attained by the upper part (consisting of the back and arms) sliding upon curved surfaces or segments of circles, formed upon the lower part or framing of the chair (consisting of the seat and legs); and by this arrangement, the back of the chair is enabled to receive any required inclination; and at the same time, the back part of the seat may be elevated or adjusted, agreeable to the inclination of the back of the chair.

In Plate VII., fig. 1, represents a section of an easy chair, showing the curved bottom of the upper part of the chair, resting upon the upper curved surface of the lower part or legs of the chair: *a, a, a,* being the line of action or curved division of the two parts of the chair, the back of the chair being seen at *b,* and the under part or legs at *c, c*; *d, d,* are cross rails, extending from the side rails of the chair at the front and back, for the purpose of carrying the seat; and *e, e,* are curved grooves or mortices cut in the side rail of the upper part of the chair, in which grooves, stops, or studs travel, for the purpose of preventing the back of the chair from receding too far, and, at the same time, to prevent it from coming too forward; and as these stops or studs are screwed into the lower part or legs of the chair, the upper half is rĕtained from any lifting action, as well as being guided steadily backwards and forwards, and held fast when required; of course, it will be perceived that the length of these grooves will govern the reclining action of the chair: *f,* is the foot-rest, being suspended to the two sides of the chair, and moves on studs at *g*; *h,* is a lever, which, in connexion with the framing of the foot-rest *f,* accommodates the inclination of the back and seat of the chair to the desire of the person reclining: it will be perceived that there is a small inclined plane *i,* on the side rails of the chair, to cause the back part of the seat to rise as the back of the chair recedes. It now remains to describe the action of the chair, which is as follows:—when the person who sits in the chair desires to recline, the back is to be pressed slightly against the chair, and, at the same time, the feet are to be placed upon the foot-rest *f*; and by this means, the chair will attain the position shown by dots: if it is wished to resume the former position of the chair, the feet are to be pressed downwards, and the body slightly inclined forwards, which will have the effect desired.

The Patentee wishes it to be understood, that he does not intend to claim any of the parts separately, of which the same is composed; nor does he confine himself to any precise shape or style of the chair; but that he does claim the forming of the upper and lower framings of easy chairs in two parts, and in such manner, that they act by means of curved surfaces, formed of the segments of circles, aided by a bar or lever, and leg-rest, as described.—[*Inrolled in the Inrolment Office, March,* 1833.]

To ALEXANDER STOCKER *and* WILLIAM STOCKER, *both of the Union Rolling-mills, Birmingham, in the county of Warwick, machinists, for their invention of various improvements in machinery, for manufacturing iron and other metal tips for the heels and toes of shoes, chain links, and other articles.*—[Sealed 22d October, 1832.]

THE subject of this patent is a machine for bending small straight pieces of iron or brass into curved shapes, for the heels and toes of boots and shoes. Plate VII., fig. 2, is a horizontal representation of the upper or operating part of the machine; fig. 3, is a side elevation of the machine complete, drawn upon a smaller scale: *a*, is a circular plate of metal, which, with the toothed wheel *b*, turns, by means of its hollow axle *c*, mounted upon a stationary shaft in the frame *d, d, d.* The wheel and plate are made to revolve with the hollow axle *c*, by a toothed pinion *e*, fixed on a vertical axle, which is driven by a pulley and band from any first mover.

Upon a disc *f*, affixed to the central stationary shaft, a templet or mould *g*, is made fast, which is to be of a semicircular or other form, according to the shape of the tip intended to be produced.

To the circular plate *a*, the piece *h*, is attached by adjustable screws, carrying a roller *k*, at its end; which roller, when placed at its proper distance by the adjusting nut *i*, acts against the edge of the piece of metal *j*, intended to be bent into the form of a tip, when the piece *h*, is carried round by the rotation of the wheel and circular plate *a*.

Suitable pieces of metal having been prepared, they are to be introduced singly into the machine, as in fig. 2, the end of the piece being held firmly between the mould or templet and a small fixed clip piece. The circular plate *a*, being then made to revolve, the roller *k*, at its end, will press the straight piece of metal *i*, round the stationary templet or mould *g*, into the semicircular form shown by dots.

It will, of course, be understood, that the templet must be changed to suit the particular form of tip intended to be produced, and that the pieces of metal are to be cut off to the necessary length before they are introduced into the machine.

In case the ends of the tips should be required to be bent inwards, or flattened towards the extremities like a horse-shoe, the mould or templet must be shaped accordingly; and for the purpose of withdrawing the tip when formed, the templet or mould *g*, may be raised up by a pin on the side of the circular plate as it goes round, depressing a rod *l*, which acts upon a lever *m*, and causes the central vertical shaft *n*, to be lifted.

The form of the bed on the disc *f*, may be such as shall give a dished shape to the tip, if required, in order to make it take firm hold of the leather; and the form of the roller *k*, may also be such as shall assist in giving any particular figure to the tip.

The Patentees say, in conclusion, that they "do not claim any exclusive right to the invention, or the use of such parts as the circular plate *a*, the axle and pinion *e*, or the roller *k*, but to such a combination and application of them as is necessary to constitute the particular machine which we have described, and of which they are the inventors."—[*Inrolled in the Inrolment Office, April*, 1833.]

To THOMAS PARSONS, *of Newport, in the county of Salop, gentleman, for certain improvements in locks for fastenings.*—[Sealed 3d December, 1833.]

THIS invention of improvements in locks consists, firstly, in the introduction of a moveable support between that tumbler which intercepts the motion of the bolt, and the tumbler upon which the key acts, which support being moveable, is capable of adjustment; the second part of the improvements consists in the mode of adjusting the bit of the key at pleasure, so as to suit the situation of the before-mentioned moveable support. The third and last part of the invention consists in the application of lever tumblers to padlocks, door locks, &c.

Fig. 6, Plate VII., is a view of a lock, manufactured according to the Patentee's improvements, the face plate of the lock being removed, for the purpose of more clearly showing the interior: *a, a,* is the bolt; *b,* the lever tumbler, which, if it is not raised with a key adjusted to it, prevents the bolt from being shot, by keeping hold of a pin or stud fixed in the bolt, as will be hereafter described; *c,* is another tumbler, called by the Patentee the key tumbler; *d,* the adjustable key, in the key-hole, which key is thrown back in this figure; *e,* is the moveable support or prop, upon which the lever tumbler *b,* rests, which moveable support constitutes the first part of the improvements. It will be seen, by reference to the figure, that the moveable support or prop *e,* has an arm, which connects the said moveable support to a slide *f.* This slide has a slot, and also a boss *g,* which is connected to it. The slide *f,* works upon a pin or stud *h,* which is fastened to the middle plate. The slide *f,* and moveable support *e,* are moved or adjusted at pleasure by a screw *i,* which is supported by a stationary arm *k,* and which screws into the boss *g*; and by this means the moveable support or prop may be adjusted at pleasure: an aperture *l,* is left in the end plate, for the purpose of introducing a screw-driver to turn the head of the screw, and by this means adjust the moveable support. It will now be evident, that by the above arrangement the moveable support can be brought nearer to, or further from, the fulcrum *m,* of the lever tumbler *b*; and thus the key tumbler *c,* must be lifted by the key, more or less, to free the stud *n,* of the bolt from the tumbler *b,* for the purpose of shooting the bolt.

Fig. 7, is another interior view of the lock, the key *d*, in this figure being just ready to shoot the bolt *a*. In this figure, the moveable support or prop *e*, is represented to be as far from the fulcrum *m*, of the lever tumbler *b*, as possible, the pin or stud *h*, being close up against the end of the slot in the slide *f*, and consequently the key will have to lift the key tumbler *c*, a greater distance than in the preceding figure; and to accomplish this object, the key is made adjustable, as is hereafter described.

Fig. 8, is another view of the lock, which is here given, for the purpose of showing the index *o*, and the scale *p*: the index is connected with the slide *f*, and works in the slot *g*, so that, by removing the front plate, it may be exactly seen how far the moveable support is removed from the fulcrum of the tumbler. Fig. 9, is a view of a key for this improved lock, with the adjustable piece *r*, which is adjusted by screwing or unscrewing. Fig. 10, represents a padlock, with the improvements attached thereto; the tumblers *b*, which are behind one another in this figure, are shown in the position they assume when acted upon by the springs; and consequently, as they are not raised together, as in the figure, the shackle cannot get free. The Patentee here observes, that his invention is susceptible of many modifications, and would act as well with two tumblers working vertically, as it does with one lever and one vertical tumbler, as in fig. 6; and also the moveable support may be made to act as a lever, and the tumblers in the padlock may be applied to box or door locks.

The Patentee states, in conclusion, that he claims as his invention, firstly, the moveable support, with the slide *f*, and screw *i*, connected with it. Secondly, the adjustable part of the key, as shown in fig. 9, at *r*; and, thirdly, and lastly, the manner of applying the lever tumblers to padlocks and door locks.—[*Inrolled in the Inrolment Office, June*, 1834.]

To JAMES HARDY, *of Wednesbury, in the county of Stafford, gentleman, for his invention of a certain improvement or certain improvements in the making or manufacturing of axletrees for carriages, and other cylindrical or conical shafts.*—[Sealed 4th April, 1835.]

THIS invention consists, first, in giving to bars of iron in a heated state peculiar shapes by means of rolling, in order that a series of such bars, when combined in close lateral contact, shall form a cylindrical figure; second, in combining in a way similar to that technically called faggotting, a series of such peculiarly shaped bars as segmental portions of a cylinder, and after heating such combined series of bars in an air furnace to the proper welding heat, passing them between rollers for the purpose of bringing the particles of metal into a state of perfect cohesion; third, in working such combined bars between cylindrical swages or dies under a tilt hammer or metal helve, for the purpose of condensing and hardening the metal, and perfecting the cylindrical figure; and also in applying the same method of swaging between dies under a tilt hammer or metal helve to bars of iron prepared in any of the ordinary modes, either of cylindrical or conical forms, for axletrees, cart arms and shafts, applicable to various purposes.

In order to render the advantages of the improvements evident, it should be first observed, that the principal qualities requisite in shafts applicable to the paddle-wheels of steam-packets, to axles for locomotive-engines and carriages, to piston rods, to constructing the shanks of anchors, and other similar uses, are lightness of material, with stiffness, tenacity, and strength, and capability of resisting the strain, tension, or pressure to which they may be subjected. These qualities depend upon the purity of the iron of which the shafts are made, and the manner in which the portions of the metal are brought together and caused to adhere.

The ordinary method of producing iron shafts is by piling together bars of puddled iron, and rolling them at the mill into cylindrical forms, or by reducing scrap iron into blooms or slabs under the forge hammer, and piling these blooms or slabs upon each other, which, when heated, are welded into one mass under the hammer in a square figure, and afterwards its angles are reduced and rounded under the hammer: thus, by repeated heating and hammering, the fibres of the iron become considerably injured and distorted, and the form of the shaft is rendered more or less irregular, dependant on the skill of the workman.

For shafts or shanks of anchors, round, flat, or square bars of rolled iron are faggotted together, and the mass being heated in portions, the parts are progressively brought into cohesion by the operation of hammering, which sometimes causes imperfect union or faulty parts to occur in the mass between the several heats.

Having now set out the ordinary methods of producing iron shafts, we shall proceed to explain the improved mode of effecting that object:—First, the best scrap iron is procured, and cleansed from rust and other impurities; this is worked into bars in the ordinary way, and then cut down, and the bars piled according to the length and substance required. These are then brought to welding heat, in order to be shaped between grooved rollers. Now commences the first part of the improvement. A cylindrical shaft of a given diameter is required to be made. A circle is described, something larger in diameter than the required shaft, and that circle is divided into six, eight, ten, or any other number of equal segments, as at *a, a, a,* fig. 11, in the drawing, which represents a section cut transversely through one of the improved shafts: a concentric circle *b*, is then described. This concentric circle represents a cylindrical rod of rolled iron, which is to constitute the central part of the shaft. He then prepares grooved rollers capable of producing the required figure, as shown at fig. 12, and proceeds to roll out the heated bars before mentioned into straight lengths, having radial sides and segmental upper and under surfaces. Eight, or any other proper number of these radial bars, are now combined in the manner called faggotting, having a central rod *b*, if the shaft is intended to be solid, or without the central rod *b*, if the shaft is intended to be hollow. One or more iron hoops are placed at a little distance from each end of the faggot, for the purpose of holding the bars together, and then, after introducing the ends successively into the furnace, and raising the metal to welding heat, they are welded under the helve or tilt hammer, after which the hoops are knocked off. The faggot of bars, now firmly united at its ends, is again introduced into the air-furnace, and, when raised to a welding heat, passed between rollers having a semi-cylindrical groove formed in each, as the ordinary rollers for producing cylindrical rods. This operation of rolling brings all the surfaces of the segmental bars which are in contact into cohesive union, that is, welds them together. This constitutes the second feature of the improvement. The shaft is now brought under the operation of the tilt hammer, or metal helve, which holds the dies or swages for the purpose of perfecting the figure of the shaft, and giving greater density to the metal. The precise form or construction of the tilt hammer or helve is of little consequence, but the dies or swages must be made to suit the size and figure of the intended shaft. Fig. 13, is a front view of the dies or swages *c, c,* held in the stocks *d, d,* showing the manner of fixing the one to the tilt hammer or helve, and the other to the anvil block. Fig. 14, is a side view of the same, with the shaft *g,* under operation. Fig. 15, represents the face or horizontal appearance of one of the dies or swages, which are held in the stocks *d, d,* by means of their dove-tailed sides, and their positions in the stocks may be adjusted by fixed screws cast into the smaller end of each die, as shown at *e, e*; which screws pass through brackets *f, f,* and are drawn up to their bearings by nuts, with soft washers intervening to prevent the jar of the hammer loosening them. The dies or swages are made with corresponding recesses or grooves, formed as segments, of about nine-tenths of the radius of a semi-cylinder; the diameters of which must be about one-tenth larger than the intended diameter of the shaft, in order that the opening may admit the shaft before its substance is condensed under the action of the tilt hammer or helve, and reduced to its desired dimensions, which is done by turning the shaft round in the dies in order to present a different surface of metal at every blow, the shaft being at the same time progressively advanced through the dies, as the portions acted upon become finished.

Having described the improved method of manufacturing cylindrical shafts, the Patentee proceeds to explain that part of his invention which applies to the making of axletrees under the tilt hammer or metal helve.

The ordinary way of preparing by hammering at the forge the rough shafts for axles, technically called cart or waggon arm moulds, is well understood; we shall, therefore, only say, that having prepared an arm mould in the ordinary way while in its heated state, two incisions are made in the arm mould with a cold chisel at those parts which will be subjected to the greatest friction against the box of the wheel when the axle is in use. Into those incisions wedge-shaped pieces of steel are driven. The arm mould is then replaced in the air-furnace, and when sufficiently heated to weld the iron and steel together, it is then subjected to the operation of the tilt hammer, or metal helve, by placing its conical or cylindrical end in the larger of the two grooves *h*, of the dies shown at fig. 16: the arm is then subjected to the same sort of hammering operation described before. The iron and steel by these means becomes perfectly welded together, and the surface of the arm is rounded to the proper figure; and to render it still more perfect, the arm is then placed in the smaller groove *i*, where it receives a few more strokes, and the rounding of the arm becomes finished. When axletrees with collars are required to be made, dies with a suitable groove or recess are employed.

It will of course be understood, that grooves of every required variety of size, either of a cylindrical or conical form, must be provided, and which may be attached to and detached from the blocks with facility.

In connexion with the operation of rounding the shafts or axles under the dies, a strong current of wind is applied and urged by a blowing apparatus, and directed by a jet along the lower die for the purpose of blowing away the scales which may be disengaged from the surface of the metal while under the hammer, and in order to cool the dies, and more effectually to obtain a clear and smooth surface. A jet of water is also employed, which may be occasionally projected along the heated metal under operation for the purpose of disengaging the tenacious parts of the scale. The advantages of this mode of rounding the axle arms, are the smoothness and equality of the surface produced, which obviates the necessity of turning them, and also gives to the surface a hardness which renders it capable of resisting, in a greater degree, the injurious effects usually produced by friction on polished surfaces.—[*Inrolled in the Rolls Chapel Office, October*, 1835.]

Specification drawn by Messrs. Newton and Berry.

ON LORD BROUGHAM'S PATENT LAW AMENDMENT BILL.

We are induced to publish the following copy of the Bill, now made the law of the land, " for the *better protecting* of Patentees " in their rights, with the addition of a short note upon each clause, showing how far the new Act is likely to effect its professed object. If it can be made to work *at all*, under its present grammatical and legal phraseology, it may be fairly intituled, "An Act to make a certain arrangement of Words equivalent to any other arrangement of the same, for the *better protecting* of Patentees ! !"

The copies of the Act, published under authority by the King's printers, do not accord, in several material instances, with the amendments agreed upon by the Commons, printed by the authority of the House of Lords, and ordered to be engrossed by the two Houses of Parliament, *after their conference*, on the 7th of September last. If the engrossment, in its actual state, as inrolled in the Record-office in the Tower, agree with the King's printers' copy, it has certainly been altered in those instances, without any apparent authority of Parliament. The correctness of this assertion may be ascertained, by a careful examination of the bills and amendments printed by the authority of Parliament. We deem it a public duty to state the fact of these discrepancies, which we shall notice in their order; and we strongly recommend to every party intending to take *any* steps under this "miserable bungling piece of legislation," as Mr. Mackinnon termed the Bill in the House of Commons, upon its second reading, to have an inspeximus of the engrossment, and to be satisfied what its actual state is—what *are* the amendments inserted, and what *are not the authorised* amendments, which may appear upon the face of the roll of the King's printers' edition of the Act. The copy of the Bill, which we now present to our readers, is printed from the authorised bills and amendments, accurately examined and compared for this Journal. The notes to the clauses will point out the discrepancies to which we allude.

COPY OF A BILL,

INTITULED,

AN ACT TO AMEND THE LAW TOUCHING LETTERS PATENT FOR INVENTIONS, WITH THE AMENDMENTS FINALLY AGREED UPON BETWEEN THE LORDS AND COMMONS, AND INSERTED UPON THE ENGROSSMENT OF THE ACT, AS PASSED 5 AND 6 GUIL. IV., CAP. 83 (10th September, 1835).

CLAUSE I.

Any person having obtained Letters Patent for any invention, may enter a disclaimer of any part of his [title or] *specification, or a memorandum of any alteration therein, which, when filed, to be deemed part of such* [title or] *specification. Caveat may be entered as heretofore. Disclaimer not to affect actions pending at the time. Attorney-General may require the party to advertise his disclaimer.*

Whereas it is expedient to make certain additions to and alterations in the present law touching Letters Patent for inventions, as well for the better protecting of Patentees in the rights intended to be secured by such Letters Patent, as for the more ample benefit of the public from the same; be it enacted, by the King's most excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons in this present Parliament assembled, and by the authority of the same, that any person, who, as grantee, assignee, or otherwise, hath obtained, or who shall hereafter obtain, Letters Patent, for the sole making, exercising, vending, or using of any invention, may, if he think fit, enter with the clerk of the patents, of England, Scotland, or Ireland, respectively, as the case may be, having first obtained the leave of his Majesty's Attorney-General or Solicitor-General in case of an English patent, of the Lord Advocate or Solicitor-General of Scotland in case of a Scotch patent, or of his Majesty's Attorney-General or Solicitor-General for Ireland in case of an Irish patent, certified by his fiat and signature, a disclaimer of any part of either the title of the invention or of the specification, stating the reason for such disclaimer, or may, with such leave as aforesaid, enter a memorandum of any alteration in the said title or specification, not being such disclaimer or such alteration as shall extend the exclusive right granted by the said Letters Patent; and such disclaimer or memorandum of alteration being filed by the said clerk of the patents and enrolled with the specification, shall be deemed and taken to be part of such Letters Patent, or such specification, in all courts whatever: provided always, that any person may enter a caveat, in like manner as caveats are now used to be entered, against such disclaimer or alteration; which caveat being so entered, shall give the party entering the same a right to have notice of the application *being heard* by the Attorney-General, or Solicitor-General, or Lord Advocate respectively: provided also, that no such disclaimer or alteration shall be receivable in evidence in any action or suit, save and except in any proceeding by *scire facias*, pending at the time when such disclaimer or alteration was enrolled; but in every such action or suit the original title and specification alone shall be given in evidence, and deemed and taken to be the title and specification of the invention for which the Letters Patent have been or shall have been granted: provided also, that it shall be lawful for the

Attorney-General, or Solicitor-General, or Lord Advocate, before granting such fiat, to require the party applying for the same to advertise his disclaimer or alteration in such manner as to such Attorney-General, or Solicitor-General, or Lord Advocate, shall seem right; and shall, if he so require such advertisement, certify in his fiat that the same has been duly made.

In the marginal reference to this clause, the words "title or" should have been twice inserted. We have done this between [ ]. By this clause, a Patentee, wishing to disclaim, is bound to state a reason for his disclaimer; but he is *not* bound to give any reason for *any* alteration, or for *any number of alterations,* he may seek to insert in his specification: surely a reason would be equally necessary in the latter cases. A party entering a caveat against a disclaimer or alteration, is to have *a right* of notice of the application "*being* heard:" the clause does not say *who shall be obliged to give the notice;* which notice, if the grammar of the clause is to be construed by English rules of syntax, is to be given by somebody, whilst the application is actually in the course of *being* heard!! We suppose the learned framer of this enactment meant that the notice might be given after the application *was* heard, for any use that may be made of this clause. In the after part of this clause, the words "provided also" are metamorphosed to a noun substantive, governing the verb "shall," and may serve to work the preceding machinery of the clause as an *eccentric* motion.

CLAUSE II.

Mode of proceeding where Patentee is proved not to be the real inventor, though he believed himself to be so.

And be it enacted, that if in any suit or action it shall be proved, or specially found by the verdict of a jury, that any person who shall have obtained Letters Patent for any invention, or supposed invention, was not the first inventor thereof, or of some part thereof, by reason of some other person or persons having invented or used

the same, or some part thereof, before the date of such Letters Patent; or if such Patentee or his assigns shall discover that some other person had, unknown to such Patentee, invented or used the same, or some part thereof, before the date of such Letters Patent, it shall and may be lawful for such Patentee or his assigns to petition his Majesty in Council to confirm the said Letters Patent, or to grant new Letters Patent, the matter of which petition shall be heard before the Judicial Committee of the Privy Council; and [if] such Committee, upon examining the said matter, and being satisfied that such Patentee believed himself to be the *first and* original inventor, and being satisfied that such invention, or part thereof, had not been publicly and generally used before the date of such first Letters Patent, may report to his Majesty their opinion that the prayer of such petition ought to be complied with, whereupon his Majesty may, if he think fit, grant such prayer; and the said Letters Patent shall be available in law and equity, to give to such petitioner the sole right of using, making, and vending such invention as against all persons whatsoever, any law, usage, or custom to the contrary notwithstanding: provided that any person opposing such petition shall be entitled to be heard before the said Judicial Committee: provided also, that any person, party to the former suit or action, touching such first Letters Patent, shall be entitled to have notice of such petition before presenting the same.

The above clause is liable to the most serious objections. After a trial, and the verdict of a jury, as to want of original invention in some part of a patent, the Patentee may petition the King in Council to confirm the applicant's Letters Patent, or to grant new Letters Patent. In what state this clause leaves the interests and rights of the Patentee, from the period of the verdict, to that of the final decision of the Council upon he application, the judges can alone determine. But there is probably a little IF in this clause, which will save all parties any trouble about its working. "Your *if* is the only peace-maker; much virtue in *if!*" *Touchstone.* We have printed this IF as it stands in ALL the copies, authorised by Parliament, before the words "such committee." ***This*** IF ***is not expunged by the amendments printed,*** and it ***may possibly*** stand in the engrossment, rendering the whole clause incapable of any grammatical construction, and, of course, totally inoperative! The words "*first and,*" before "original inventor," are not in the printed amendments—how came they in the engrossment? There is in this clause a happy "confusion worse confounded," which laughs syntax to scorn; "to petition," has its relative in "which petition," and "such petition," all grinning with delight at the juxta-position assigned them by the "learned" and noble framers of the Act!!

An inventor is not secured by this clause in the *private* use of his invention *to the extent* of such use, previous to a party patenting a similar invention; this is a great omission.

CLAUSE III.

If in any action or suit a verdict or decree shall pass for the Patentee, the judge may grant a certificate, which being given in evidence in any other suit, shall entitle the Patentee, upon a verdict in his favour, to receive treble costs.

And be it enacted, that if any action at law, or any suit in equity, for an account shall be brought in respect of any alleged infringement of such Letters Patent heretofore or hereafter granted, or any *scire facias* to repeal such Letters Patent, and if a verdict shall pass for the Patentee or his assigns, or if a final decree or decretal order shall be made for him or them upon the merits of the suit, it shall be lawful for the judge before whom such action shall be tried to certify on the record; or the judge who shall make such decree or order to give a certificate under his hand, that the validity of the patent came in question before him, which record or certificate being given in evidence in any other suit or action whatever touching such patent, if a verdict shall pass, or decree or decretal order be made, in favour of such Patentee or his assigns, he or they shall receive treble costs in such suit or action, to be taxed at three times the taxed costs, unless the judge making such second or other decree or order, or trying such second or other action, shall certify that he ought not to have such treble costs.

This is really a redeeming clause as to its matter, only that it will puzzle a legal algebraist to determine whether the sum total of the *ifs* in this clause amounts to a negative, or to a positive quantity; but whatever be the result of the ifs, there is a judicial "*unless*" with the sign negative in the rear, which necessarily alters the preceding "tottle" of + and —, and leaves the Patentee in breathless expectation, whether or not he will be "sent away hungry," after expecting to revel in treble costs! The Act should certainly have provided, that a defendant, in an action of infringement, should have notice given him of the formidable certificates in the hands of the Patentee, and such defendants should be rendered liable to *treble costs*—only for acts of infringement—*after* such notice, the discretion would then be properly left to the judge as to the award of treble costs.

CLAUSE IV.

Mode of proceeding in case of application for the prolongation of the term of a Patent.

And be it further enacted, that if any person who now hath or shall hereafter obtain any Letters Patent as aforesaid, shall advertise in the *London Gazette* three times, and in three *London* papers, and three times in some country paper, published in the town where or near to which he *carried* on any manufacture of any thing made according to his specification, or near to or in which he resides, in case he *carries* on no such manufacture, or published in the county where he carries on any such manufacture, or where he lives, in case there shall not be any paper published in such town, that he intends to apply to his Majesty in Council for a prolongation of his term of sole using and vending his invention, and shall petition his Majesty in Council to that effect, it shall be lawful for any person to enter *a caveat* at the Council-Office; and if his Majesty shall refer the consideration of such petition to the Judicial Committee of the Privy Council, and notice shall first be by HIM given to any person or persons who shall have entered *such caveats*, the petitioner shall be heard by his counsel and witnesses to prove his case, and the persons entering caveats shall likewise be heard by their counsel and witnesses; whereupon, and upon hearing and inquiring of the whole matter, the Judicial Committee may report to his Majesty that a further extension of the term in the said Letters Patent should be granted, not exceeding seven years; and his Majesty is hereby authorised and empowered, if he shall think fit, to grant new Letters Patent for the said invention for a term not exceeding seven years after the expiration of the first term, any law, custom, or usage to the contrary in any wise notwithstanding; provided that no such extension shall be granted, if the application by petition shall not be made and prosecuted with effect before the expiration of the term originally granted in such Letters Patent.

The above clause was expunged by the Commons, and was restored upon conference between the two Houses. The word "carries," as printed twice from *our* authority, is rendered *carried* by the King's printer, possibly upon the authority of the engrossment. This change of two words to the past tense, whilst the remaining portion of the clause is worded in the present tense, renders the sense ambiguous. But, "this jewel, torn from the crown," and again restored, as my Lord Brougham said, is sadly defective in the clearness of its water. "It shall be lawful for any person to enter *a caveat*" against a petition for the extension of the term of a patent; "and if HIS MAJESTY shall refer the consideration of such petition, &c., and notice shall be by HIM given to any person or persons entering *such caveats*, the petitioner shall be heard," &c. Now, excepting the judges shall declare (for we would not advise any person entering a caveat against a petition for prolongation of a term to trust to the opinion of the Crown lawyers), that the legal sense of a clause may be directly contrary to its grammatical construction—*His Majesty* must, under his sign manual, *himself* "give notice to any person or persons entering *such caveats!!*" the plural being here equivalent to *a caveat*. This duty HIS MAJESTY must, of course, perform, or the petitioner *cannot be heard* by his counsel. His Majesty is under great obligation to the "*learned Lords*" for their intending to employ HIM as a clerk. This is really too radical.

CLAUSE V.

In case of action, &c., notice of objections to be given.

And be it enacted, that in any action brought against any person for infringing any Letters Patent, the defendant on pleading thereto shall give to the plaintiff, and in any *scire facias* to repeal such Letters Patent, the plaintiff shall file with his declaration a notice of any objections on which he means to rely at the trial of such action, and no objection shall be allowed *to be made* in behalf of such defendant or plaintiff respectively at such trial, *unless he prove the objections stated in such notice:* provided always, that it shall and may be lawful for any judge at chambers, on summons served by such defendant or plaintiff on such plaintiff or defendant respectively, to show cause why he should not be allowed

to offer other objections whereof notice hath not been given, as aforesaid, to give leave to offer such objections, on such terms as to such judge shall seem fit.

Upon the above clause we have to remark, that "no objection *shall be allowed to be made*" in behalf of the plaintiff or defendant respectively at such trial, "*unless he prove* the objections stated in such notice." This singular enactment renders it necessary *to prove* the objections in court *before* they shall be allowed *to be made!!* The judges may possibly be able to direct counsel how this Hibernian process is to be effected. This is verily a good *working* Act! It reminds us of the steam-boat, made by a celebrated civic oratorical engineer for the King of Greece, which had its machinery so curiously disposed, that, spite of all the rhetoric and expostulations of its constructor, the self-willed vessel pertinaciously insisted upon performing its *début-voyage* down the Thames, STERN FOREMOST, the other end obediently following its leader, to the infinite astonishment and amusement of the thousands who witnessed, and rapturously cheered the phenomenon!

CLAUSE VI.

As to costs in actions for infringing Letters Patent.

And be it enacted, that in any action brought for infringing the right granted by any *Letters Patent, in taxing the costs thereof,* regard shall be had to the part of such case which has been proved at the trial, which shall be certified by the judge before whom the same shall be had, and the costs of each part of the case shall be given according as either party has succeeded or failed therein, regard being had to the notice of objections, as well as the counts in the declaration, and without regard to the general result of the trial.

This is a well-meant clause; its only defect is, that, by the usual confusion of antecedent and relative, *the costs of the Letters Patent* are to be taxed under the working of the word "*thereof.*" The judges may mend this clause by dove-tailing the "*thereof*" to the preceding noun "action," although two intermediate substantives have anterior claims. There is no statute against grammatical *trigamy*, so this literary seeker of nouns may copulate with all three.

CLAUSE VII.

Penalty for using unauthorised the name of a Patentee, &c.

And be it enacted, that if any person shall write, paint or print, or mould, cast or carve, or engrave or stamp, upon any thing made, used, or sold by him, for the sole making or selling of which he hath not or shall not have obtained Letters Patent, *the name, or any imitation of the name* of any other person who hath or shall have obtained Letters Patent for the sole making and vending of such thing, without leave in writing of such Patentee or his assigns: or if any person shall upon such thing not having been purchased from the Patentee, or some person who purchased it from or under such Patentee, or not having had the license or consent in writing of such Patentee or his assigns, write, paint, print, mould, cast, carve, engrave, stamp, or otherwise mark the word "Patent," the words "Letters Patent," or the words "by the King's Patent," or any words of the like kind, meaning, or import, with a view of imitating or counterfeiting the stamp mark *or other device* of the Patentee, or shall in any other manner imitate or counterfeit the stamp, or mark, or other device of the Patentee, he shall for every such offence be liable to a penalty of fifty pounds, to be recovered by action of debt, bill, plaint, process, or information, in any of his Majesty's Courts of Record at *Westminster*, or in Ireland, or in the Court of Session in Scotland, one-half to his Majesty, his heirs, and successors, and the other to any person who shall sue for the same: provided always, that nothing herein contained shall be construed to extend to subject any person to any penalty in respect of stamping or in any way marking the word "patent" upon any thing made, for the sole making or vending of which a patent before obtained shall have expired.

> The above clause is drawn with a deal of speciality; it *merely omits* doing what my Lord Brougham declared in Parliament was its principal object, to effect the preventing of persons exposing for sale articles *not patented*, but having thereon the word "patent" affixed, in deception of the public. Thus the pretenders to patent rights are left at liberty to gull John Bull, as they have hitherto done, with *pseudo-patents;* only taking care not to use or imitate the name or device of an actual Patentee.

We now leave our readers to form their own estimation of this most extraordinary specimen of legislation. We may be mistaken in our judgment upon it; and we almost mistrust our senses, when looking at the pages of a late number of a contemporary scientific journalist, who says, "We congratulate our readers upon the passing of this measure, strengthening, *as it does*, the possessors of patent property!" "We trust we shall, in future, hear no more of the insecurity of Patent Law!" "We have no doubt that a clamour will be made by certain interested parties, in order to get the question of Patent Law re-opened," &c. "We, therefore, say to all Patentees, and would-be Patentees, beware of those who would again open the question." "We consider it now to be settled—AND WELL SETTLED!!!" Could we conceive our contemporary to be capable of sarcastic praise, we should say, that he has afforded a most happy specimen of his talent. We would take the liberty of inviting our brother journalist, whom we cannot presume to be connected with "certain interested parties," in the vain attempt to blind the public as to the numerous and intrinsic defects of Lord Brougham's late Act, either to give a rational exposé of the errors we may have fallen into in *our* criticism of this Bill, or at once, in his next publication, candidly to disabuse *his* readers as to the statements in support of the Bill, which he has been led to make.

SCIENTIFIC NOTICES AND NOVEL INVENTIONS.

HALLEY'S COMET.

The clouded state of the atmosphere in all parts of the kingdom during the present visit of this Comet, has prevented its progress being accurately traced; but from occasional observations made when the Comet has been visible, it seems to have taken an apparently higher range in the heavens than was expected, either by Mr. Lubbock or by the foreign astronomers. This may be readily accounted for, as the progress of the Comet, from some cause, seems to have been delayed about a week later than was anticipated, so that its approach to the earth has been nearer by some millions of miles than we expected, and, consequently, the angle it would form with such of the stars as it appeared to progress between, would be in some degree varied; instead, therefore, of being seen on proceeding from the Bull's horns, to pass through the lower parts of the Bear, we find the apparent path has been through the neck and down the back and tail of that constellation, but that it has subsequently, as it receded, fallen into the path anticipated.

It also appears that the Comet has two tails, distinctly visible by means of an achromatic telescope. The main tail, or barbutus, is much longer and brighter than the other, and points nearly north-west; the shorter barbutus makes an angle of about 75°, with the longer pointing more eastward.

CARLSRUHE ACCENTING PIANO-FORTE.

An instrument has been lately perfected and exhibited by a manufacturer of this city, which is so constructed as to resemble in its tones the articulation of the human voice. The instrument contains sixteen sounds, and as many keys; and by means of combination, words are apparently articulated: it is said that sentences even may be constructed with musical intonation. This curious instrument has an orchestral effect, which is highly deceptive in its complete imitation of a vocal chorus.

New Patents
SEALED IN ENGLAND,
1835.

To Joel Spiller, of Battersea, in the county of Surrey, engineer, for his invention of an improvement or improvements upon boilers, for generating steam or heating water, or other fluids, for useful purposes.—Sealed 26th September—6 months for inrolment.

To William Samuel Henson, of Chard, in the county of Somerset, machinist, for his invention of certain improvements in certain machinery, used for making bobbin-net lace, for the purpose (by such improvements) of making certain kinds of ornamented net or lace with such machinery.—Sealed 1st October—6 months for inrolment.

To Edwin Hoare, of Stonehouse, in the county of Gloucester, clothier, for his invention of a method of preventing the darkness of colour, which frequently occurs near the lists, as compared with the colour of the middle of woollen cloths in the process of heating them in water, or by steam, on rollers.—Sealed 1st October—6 months for inrolment.

To James Bullough, of Blackburn, in the county of Lancaster, mechanic, for his invention of certain improvements in hand-looms and power-looms.—Sealed 1st October—6 months for inrolment.

To Charles Pierre Devaux, of Fenchurch-street, in the city of London, merchant, for certain improvements in smelting iron, stone, or iron ore, being a communication from a foreigner residing abroad.—Sealed 8th October—6 months for inrolment.

To Apelles Howard, of Stockport, in the county of Chester, cotton-spinner, and John Scattergood, of Manchester, in the county of Lancaster, machine broker, for their invention of improvements in looms for weaving, whether worked by hand or other power.—Sealed 8th October—6 months for inrolment.

To Thomas Jevons, of Liverpool, in the county of Lancaster, merchant, for certain improved machinery, to be used in manufacturing bar or wrought iron into shoes for horses, and also into shapes for other purposes, being a communication from a foreigner residing abroad.—Sealed 8th October—6 months for inrolment.

To Robert Jupe, of New Bond-street, in the parish of St. George, Hanover-square, in the county of Middlesex, upholsterer, for his invention of improvements in ornamental dessert, flower, and other stands.—Sealed 9th October—6 months for inrolment.

To John William Fraser, of Ludgate-hill, in the city of London, artist, for his invention of improvements in raising weights or substances from below to the surface of the water.—Sealed 15th October—6 months for inrolment.

To John Bird, of Birmingham, in the county of Warwick, gentleman, for his invention of an improved method of making and compounding printers' ink, paints, and other pigments.—Sealed 15th October—6 months for inrolment.

To Samuel Draper, of Basford, in the county of Nottingham, for his invention of improvements in producing plain or ornamental weavings.—Sealed 15th October—6 months for inrolment.

To David Mushet, of Coleford, in the parish of Newland, in the county of Gloucester, iron-master, for his invention of a certain improvement in the art of making or manufacturing bar iron or malleable iron.—Sealed 22d October—6 months for inrolment.

To Samuel Colt, of Ludgate-hill, in the city of London, gentleman, for his invention of certain improvements applicable to fire-arms.—Sealed 22d October—6 months for inrolment.

To Richard Barber, of Leicester, cotton-winder, for his invention of an improvement in reels for reeling.—Sealed 22d October—6 months for inrolment.

To Samuel Slocum, of the New-road, St. Pancras, in the county of Middlesex, engineer, for his invention of improvements in machinery for making pins.—Sealed 22d October—6 months for inrolment.

To John Dyer, of Mark-lane, in the city of London, merchant, for improvements in the materials used for fining or clarifying liquids, being a communication from a foreigner residing abroad.—Sealed 22d October—6 months for inrolment.

To William Patterson, of Dublin, gentleman, for his invention of an improvement in converting hides and skins into leather, by the application of matter obtained from a material not hitherto used for that purpose.—Sealed 22d October—6 months for inrolment.

To John Baring, of Bishopsgate-street, in the city of London, Esq., for an invention of a machine, for combing or brushing wool, flax, and other fibrous materials, into teeth, set in a cylinder or otherwise, for the purpose of separating the longer from the shorter fibre, being a communication from a foreigner residing abroad. —Sealed 23d October—6 months for inrolment.

To James Walton, of Sowerby Bridge, in the parish of Halifax, in the county of York, frizer, for his invention of certain improvements for dressing, finishing, and setting the face on woollen, or other cloths requiring such process.—Sealed 23d October—6 months for inrolment.

To George Baxter, of Charterhouse-square, in the county of Middlesex, engraver, for his invention of improvements in producing coloured steel-plate, copperplate, and other impressions.—Sealed 23d October—6 months for inrolment.

CELESTIAL PHENOMENA, FOR NOVEMBER, 1835.

D.	H.	M.	
1			Clock after the ☉ 16 m. 15 s.
—			☽ rises 3 h. 45 m. A.
—			☽ passes the mer. 9 h. 23 m. A.
—			☽ sets 1 h. 59 m. M.
2	16	46	♃'s second sat. will im.
3	2	7	♃ stationary.
	16	48	☿ in conj. with ♂ diff. of dec. 1. 46.
4	9	23	♃'s third sat. will im.
	12	27	♃'s third sat. will em.
	12	38	♃'s first sat. will im.
5			Clock after the ☉ 16m. 16s.
—			☽ rises 4 h. 38 m. A.
—			☽ passes the mer. morn.
—			☽ sets 6h. 48m. M.
	10	16	Ecliptic oppo. or ○ full moon.
6	7	12	♅ stationary.
7	7	58	♀ in inf. conj. with the ☉
—			☽ in Apogee.
	8	5	Tran. of ♀ invis. at Greenwich.
	14	23	☿ ascending node.
10			Clock after the ☉ 15m. 58s.
—			☽ rises 7h. 24m. A.
—			☽ passes the mer. 3h. 22 m. M.
—			☽ sets 0 h. 12 m. A.
	6	7	♃ in conj. with the ☽ diff. of dec. 3. 54.
11	13	23	♃'s third sat. will im.
	14	32	♃'s first sat. will im.
	16	27	♃'s third sat. will em.
12	3	45	☿ Perihelion.
13	2	28	☽ in □ or last quarter.
	2	45	♀ in conj. with ♂ diff. of dec. 0. 24.
—			Occul. η Leonis, im. 10h. 18m., em. 10h. 57m.
	15	8	♀ in the descending node.
15			Clock after the ☉ 15 m. 18 s.
—			☽ rises 0h. 12 m. M.
—			☽ passes the mer. 7h. 31m. M.
—			☽ sets 2h. 32m. A.
16			Mer. R. A. 14 h. 23 m. dec. 11. 57. S.
—			Ven. R. A. 16 h. 9 m. dec. 21. 6. S.
—			Mars R. A. 16 h. 2 m. dec. 21. 7. S.
—			Vesta R. A. 11 h. 13 m. dec. 9. 39. N.
16			Juno R. A. 7 h. 2 m dec. 2. 3. N.
—			Pallas R. A. 18 h. 1 m. dec. 3. 50. N.
—			Ceres R. A. 18 h. 30 m. dec. 27. 35. S.
—			Jup. R. A. 7 h. 8 m. dec. 22. 30. N.
—			Sat. R. A. 13 h. 53 m. dec. 9. 6. S.
—			Georg. R. A. 21 h. 57 m. dec. 13. 21. S.
—			☿ passes the mer. 22h. 40 m.
—			♀ passes the mer. 0 h. 29 m.
—			♂ passes the mer. 0h. 23 m.
—			♃ passes the mer. 15h. 26m.
	5	52	☿ stationary.
18	1	55	♄ in conj. with the ☽ diff. of dec. 0. 24. S.
	15	43	☿ in conj. with the ☽ diff. of dec. 0. 30.
	17	21	♃'s third sat. will im.
	16	25	♃'s first sat. will im.
19			☉ eclipsed, invisible at Greenwich.
	5	31	♅ in quad. with the ☉
20			Clock after the ☉ 14m. 17s.
—			☽ rises 7 h. 24 m. M.
—			☽ passes the mer. 11h. 48m. M.
—			☽ sets 4 h. 3 m. A.
	6		☽ in Perigee.
	10	30	Ecliptic conj. or ● new moon.
		53	♃'s first sat. will im.
	12	8	♂ in conj. with the ☽ diff. of dec. 0. 12.
	18	50	♀ in conj. with the ☽ diff. of dec. 0. 44.
22	12		☿ greatest Hel. Lat. N.
—			Occul. γ Sagitt. im. 5 h. 16 m., em. 6 h. 14 m.
24	1	43	☿ greatest elong. 19. 59. W.
25			Clock after the ☉ 12 m. 56 s.
—			☽ rises 0h. 57m. A.
—			☽ passes the mer. 5h. 0m. A.
—			☽ sets 9 h. 13 m. A.
	23	18	♅ in conj. with the ☽ diff. of dec. 4. 50.
27	3	46	☽ in □ or first quarter.
	12	47	♃'s first sat. will im.
	13	53	♃'s second sat. will im.

J. LEWTHWAITE, Rotherhithe.

METEOROLOGICAL JOURNAL,

FOR SEPTEMBER AND OCTOBER, 1835.

1835.	Thermo.		Barometer.		Rain in inches.
	Hig.	Low.	High.	Low.	
Sept.					
26	61	44	29,65	29,61	
27	57	47	29,57	29,49	,7
28	53	45	29,61	29,37	,025
29	62	43	29,59	29,47	
30	65	51	29,32	29,19	
Oct.					
1	58	50	29,27	29,19	
2	58	52	29,28	29,20	,475
3	56	38	29,31	29,25	,55
4	55	48	29,47	29,29	,675
5	57	40	29,73	29,58	
6	61	39	29,87	29,80	
7	57	40	30,02	29,93	,05
8	58	45	29,92	29,59	
9	55	43	29,47	29,20	,05
10	49	42	29,02	28,80	,425
11	50	38	29,59	29,20	,025
12	51	36	29,82	29,79	
13	62	50	29,94	29,85	,125
14	58	51	30,23	30,07	
15	59	50	30,31	30,28	
16	57	48	30,31	30,27	
17	57	47	30,22	30,20	
18	52	44	30,25	30,22	
19	52	28	30,21	30,02	
20	50	27	29,87	29,74	
21	48	35	29,74	29,72	,175
22	51	30	29,62	29,50	
23	48	38	29,69	29,53	,325
24	52	43	29,67	29,59	,225
25	55	37	29,68	29,30	

Edmonton. CHARLES HENRY ADAMS.

Latitude 51° 37 32 N.
Longitude 3 51 West of Greenwich.

THE

London

JOURNAL AND REPERTORY

OF

Arts, Sciences, and Manufactures.

CONJOINED SERIES.

No. XLV.

Recent Patents.

To John Somerville, *clerk, minister of Currie, in the county of Edinburgh, for his invention of certain improvements in the construction of guns or muskets, and other such fire-arms.*—[Sealed 28th April, 1835.]

This invention of certain improvements in the construction of guns or muskets, and other such fire-arms, has for its object the prevention of the accidental discharge of fowling-pieces, and other fire-arms, when from any unintentional cause the trigger of the lock is pulled at the time the hammer is at full cock, or when the hammer or flint is accidentally released, and would fire off the gun; and consists in preventing the hammer reaching the nipple of a percussion lock, or the flint reaching the steel of an ordinary flint lock, by the interposition of moveable safety studs or pins, which protrude from under the false breech before the hammers of the locks, and prevent them from descending upon the nipples or steels; such safety studs or pins being moved out of the way by the pressure or force of the right hand of the person using the gun when in the act of firing, that is, when the force of the right hand and arm is being exerted to press the butt end of the stock of the gun against the shoulder while the aim is being taken and the trigger pulled.

It is well known to all persons in the habit of using fowling-pieces or muskets, that very considerable force is and should be exerted by the right hand when firmly grasping the stock of the gun in the act of pressing the butt of the stock against the shoulder at the time of taking aim and firing; and it is by this force, exerted by the right hand at this time, that the protruding safety studs are moved out of the way of the hammer when the trigger is pulled; and this movement of the safety studs or pins may be and is effected by the thumb of the right hand, when firmly grasping the stock, pressing upon a moveable button or stud, which acts apon levers connected to the safety pins, and draws them inwards out of the way of the hammers of the locks; or the same may be and is effected by the ball of the right thumb, when the hand is firmly grasping the stock, pressing upon a similar button or stud, and acting upon levers and studs or pins in a similar manner, or by the heel of the right hand pressing upon moveable buttons or studs, and acting in a similar manner, and producing the same effect when firmly grasping the stock of the gun in the act of firing. At the same time the gun may be safely carried when laid on the left arm, and the right hand lightly grasping the stock, as in the usual position of carrying a fowling-piece in the field, without acting upon the moveable buttons or studs, for the right hand is generally placed about an inch higher up the stock in the act of carrying the gun at rest, than it is when in the act of taking aim and firing.

In the first position, that is, carrying the gun at rest, the proper parts of the thumb or hand do not come over the moveable buttons or studs; but when the hand is drawn down towards the butt, and firmly grasping the stock in the act of firing, the proper parts of the thumb or hand are then placed over the moveable studs or buttons, and depressing them, acts upon the safety pins, and moves them out of the way of the hammers.

The Patentee here remarks, that there have been many contrivances and inventions for preventing the accidental discharge of fowling-pieces and other fire-arms, by means of sliding-bolts, catches, or stops which confine the main-spring, trigger, or hammer of the lock; but all of these require a separate movement, and force or pressure of the hands of the person using the gun, independent of the ordinary movements and force or pressure required in properly taking aim and discharging the gun: for instance, the Patentee refers to the specification of a patent granted to him on the 4th day of November, 1824, which specification was duly inrolled; and for report of which specification, see London Journal of Arts and Sciences, vol. ii. p. 12, First Series. All of such sliding-bolts, stops, or catches, or other contrivances, when requiring separate or additional movements of the hands previous to firing, are disclaimed, as not forming part of this invention, although they may be combined with these improvements, if thought desirable. And further, the Patentee disclaims all contrivances or inventions for effecting this safety, which require the thumb of the right hand to be laid along the stock to work them, or out of its natural or proper position for firmly grasping the stock in the act of firing; and further, all those contrivances or inventions which are placed on the under side of the stock, and worked by the fingers of the right hand pressing upwards when grasping the stock, as they form no part of this invention.

And in order that the improvements may be better understood, and the manner of carrying them into effect better explained, we have shown in Plate VIII. several different methods of constructing, arranging, and bringing them into use, although the Patentee does not mean or intend to confine himself to the precise form or exact arrangement therein shown and described, as the same may be varied to suit different sized guns or muskets, or the will of the manufacturer; this invention consisting, as before stated, in the manner of moving or working the safety apparatus, studs, or pins, by the right hand when firmly grasping the stock of the gun in the act of firing, as hereinbefore particularly described.

Fig. 1, is a side view of part of a double percussion gun; and fig. 2, is a top or plan view of the same, which will serve to explain the improvements, and show one method or manner of carrying them into effect: A, is the stock of the gun; B, the barrels: C, the breech; D, the nipples; E, the false breech, on the under side of which the levers which work the safety studs or pins are placed; F, is the shield of the false breech; G, triggers; H, the lock plate; and I, the hammers; all of which are constructed as in common: *a*, *a*, are the safety studs or pins, which protrude before the shield F, and work through guide pieces *b*, *b*, on the underside of the false breech, (see fig. 3,) which is a representation of it detached from the stock, and showing the arrangement of the levers, the safety pins being shown projecting outward from the false breech.

Fig. 4, is another similar view, showing the safety pins drawn inward out of the way of the hammers: *c*, *c*, are bent levers, connected by pins or joints to the safety studs at their longer ends, and having their fulcrums on pins *d*, *d*, fixed in the false breech. The other, or shorter ends of these levers, cross each other, and are connected by bridle pieces *e*, *e*, to one end of the sliding piece *f*, which is jointed at its other end to the shorter end of the bent lever *g*, having its fulcrum on a pin *h*, on the strap of the false breech : the other end of this lever *g*, is acted upon by the button, stud, lever, or part *i*, which is pressed by the thumb, or other part of the right hand (according to the situation in which the part *i*, is placed), when firmly grasping the stock in the act of firing : *k*, is a spring, attached at one end to the strap of the false breech, and the other end pressing on the longer arm of the lever *g*, and thereby tends, through the slide piece *f*, and levers *c*, to keep the safety studs at all times protruding out from the false breech, and in the way of the hammers, and would prevent their reaching the nipples on their being accidentally released, as before stated, the pins receiving the blow, and preventing their descent; but they are moved out of the way at the proper time for firing, by the pressure of the right hand or thumb depressing the part *i*, which moves the longer end of the lever *g*, and causes its shorter end to draw the slide *f*, and by the bridle pieces *e*, to move the longer ends of the levers *c*, inwards, which draw the safety studs into the false breech out of the way of the hammers, as shown in fig. 4, the spring *k*, returning them into their former position when the pressure of the hand is taken off the piece *i*.

Fig. 5, is another detached representation of the under side of the false breech, showing another arrangement for effecting the movements of the safety studs, which are shown projecting in this figure, but are shown drawn inward in fig. 6: in this instance there are two springs *k*, *k*; and the piece or button *i*, acts upon the end of the lever *g*, which turns the tumbler lever *l*, placed between the ends of the levers *c*, *c*; and moving them outward produces the movements of the studs.

The Patentee here remarks, that the piece *i*, may be shaped as shown in fig. 7, and jointed by a hinge to the stock, and be made to protrude from the stock by the spring *k*; or it may be shaped as in fig. 8, that is, like a button, the shank or tail acting upon the end of the lever *g*; or it may stand flush with the stock, and be depressed into a recess in the stock.

In figs. 1, and 2, the button or piece *i*, is shown in the position for the thumb of the right hand to act upon it; but when the pressure of the ball of the right thumb is to produce the movement of the safety studs, it must be placed in or near the position marked K, in figs. 1, and 2; and when the heel of the right hand is to effect the movements of the safety studs, the button or piece *i*, must be placed at L, or nearly so, in figs. 1, and 2.

In these two last-mentioned positions, the lever *g*, (which is acted upon by the button or piece *i*, to work the safety studs through the slide *f*,) would require to be of a different shape and differently mounted; for example, as shown in the partial detached representation, fig. 9.

In conclusion, the Patentee further remarks, that

when the hammers are down upon the nipples after discharging the gun, the ends of the safety pins press against the inner sides of the hammers; and it will, of course, be understood, that when this invention is adapted to single barrelled guns or muskets, only one pin *a*, lever *c*, and piece *e*, will be required.—[*Inrolled in the Rolls Chapel Office, October*, 1835.]

Specification drawn by Messrs. Newton and Berry.

To HENRY PRATT, *of Bilson, in the county of Stafford, miller, for his having invented certain improvements in the making or manufacturing of quarries applicable to kilns for drying wheat, malt, and other grain, and to various other purposes.*—[Sealed 11th November, 1830.]

THE improvements which the Patentee claims under the title of this invention, consists in forming quarries for kilns, and various other purposes, with oblong slots or openings at the top of conical channels for the escape of hot air, instead of small holes at the top of conical chambers, as heretofore used. These quarries the Patentee prefers to be made of cast-iron, and in strengthening the aforesaid quarries by means of placing cross bars made of cast-iron on the underside of the said quarries, and by forming sides to the conical channels aforesaid, instead of making the quarries of an uniform thickness, as those before in common use.

It should be here observed, that the oblong slots or openings are not all parallel to each other, but that some of them are placed at right angles to the others, for the purpose of more conveniently placing the strengthening bars.

The Patentee states, that the aforesaid quarries are not exclusively employed in malt kilns, but that they may be usefully employed in hot-houses, air-stoves, and in other situations where quarries are required.

The Patentee concludes his specification by saying, that he claims as his invention the application of oblong slots or openings at the top of conical channels, whether the quarries be made of cast-iron, clay cast in a suitable mould, or mastic, or of any other convenient substance, as that is not of any material consequence, though the Patentee prefers them to be made of cast-iron, as hereinbefore mentioned.—[*Inrolled in the Inrolment Office, May,* 1831.]

To ISAAC JECKS, *junior, of Bennett's-hill, in the city of London, gentleman, for his invention of an apparatus or machine for putting or drawing on or off boots.*—[Sealed 17th June, 1834.]

THIS invention consists of an apparatus for putting on or drawing off boots, and will be clearly understood by reference to the drawing shown at Plate VIII., fig. 10, and which represents a perspective elevation: *a, a, a,* are upright rails or standards, having hooks or racks affixed thereto, for the purpose of supporting the boots while the person is in the act of putting them on. At the top of the two outer ones of these standards are sockets *b, b,* for the purpose of receiving the rods *c, c*; and at the top of these rods are handles *d, d,* by which the person holds when he is putting on or pulling off his boots. The height of these rods may be regulated by screws passing through the sockets *b*: *e, e,* are parts which answer the purpose of the ordinary boot-jack now in common use, and are made of an iron rod, bent in the form shown in the drawing. The foot being inserted in the opening, the toe is placed under one end, and the heel under the other, so that the boots may be easily drawn off without any unequal strain.

The Patentee proceeds to state, that he does not confine himself to the number of standards *a, a,* as it will be evident that several may be used, especially in hotels, where it may be required to hang up the boots in the standards *a, a,* ready for their respective owners.

The Patentee goes on to state, that he would have it understood that he does not mean or intend to claim the parts *e, e,* separately, as he is aware that it is similar to the boot-jack now in common use, and that he only claims that in conjunction with the rest of his machine.

The Patentee then concludes by stating, that what he does claim as his invention is the *combination* of the standards *a, a, a,* (which have hooks or racks) and the parts *e, e,* into a machine for putting on or drawing off boots, as is before described.—[*Inrolled in the Inrolment Office, December,* 1834.]

To EDWIN CLAYTON, *of Briddlesmitle Gate, in the town and county of the town of Nottingham, baker, for his having invented an improved mode of manufacturing dough or paste for the purpose of baking into bread.*—[Sealed 31st August, 1830.]

THE improvement specified under the title of this invention, consists in making the dough or paste in a rotary kneading trough or barrel, which is mounted in bearings by hollow axles; in the interior of which barrel there is a revolving frame made of cast-iron, with cutters placed obliquely, applied thereto in the form of braces, for the purpose of kneading the dough. This revolving frame is made (by means of suitable gear) to revolve the contrary way to the barrel; and thus, as a double action is obtained, a great saving of time may be effected.

The Patentee states, that many revolving kneading troughs have been made, but none of them have been found to answer, owing to their not having the double motion of the barrel and the interior rotary frame; which action answers to operation of kneading by hand, as it tears and rends the dough asunder, and by this means a more perfect mixture of the ingredients is effected.

The Patentee's improvements will be more readily understood by reference to Plate VIII., fig. 11, which represents a front elevation of a rotary kneading trough, constructed according to improvements specified by the Patentee, the barrel being shown in section: *a*, is the barrel, into which the several ingredients, consisting of flour, water, and yeast, are put, which barrel is mounted in the framework *b*, by hollow axles *c*, and *d*, which hollow axles turn in suitable bearings at *e*; *f*, is the revolving frame, which is mounted in the interior of the barrel *a*, by axles *g*, and *h*. The ends of this revolving frame are fastened or braced together by means of the oblique cutters or braces *i*, which act upon the dough when the machine is put in motion, and thus cause the operation of kneading.

The Patentee states, that either the barrel may be made to revolve without the rotary frame, or the rotary frame without the barrel, or both may be made to revolve together, but in opposite ways. These several motions may be obtained by means of the gear-work, shown at *k*, *l*, and *m*, as will be hereafter described.

If it be desired to have the revolving motion of the barrel and rotary frame together, but in contrary directions, that motion may be obtained by fastening the hollow axle of the wheel *m*, by means of a screw *n*, to the axle *h*; which screw, when screwed up, will hold the hollow axle and the axle *h*, of the rotary frame *f*, tight, so that they will revolve together, the other wheels *k*, and *l*, being used for the purpose of reversing the motion of the barrel. It will then be found that by turning the handle *o*, the two motions will be obtained.

If it be desired to put the rotary frame *f*, only into motion, that action will be obtained by loosening the screw *n*, in the axle of the wheel *m*, when it will be found that the axle *h*, will be made to revolve freely by means of the winch *o*, without giving motion to the wheels *k*, *l*, and *m*, and thus the barrel will remain stationary. If the rotary action of the barrel be wanted, it will be obtained by turning the handle *p*, at the reverse end of the machine, which, although it puts the gear at the opposite end of the barrel into motion, yet as the hollow axle of the wheel *m*, is not fastened to the axle *h*, by the screw *n*, these wheels will revolve without carrying round the frame *f*.

The Patentee states, in conclusion, that he does not intend to claim any of the parts which separately have been before in use, nor does he intend to claim a revolving kneading trough; but what he claims is a double and reverse action of the barrel and rotary frame, as applied to the kneading of dough for the purpose of making bread.—[*Inrolled in the Inrolment Office, February,* 1831.]

To HENRY BOOTH, *of Liverpool, in the county of Lancaster, gentleman, for his invention of compositions or combinations of materials applicable to the greasing of the axle-bearings of carriages, and the axle-spindles and bearing parts of machinery in general, which he intends to denominate the patent axle grease and lubricating fluid.* —[Sealed 14th April, 1835.]

THE Patentee's object is to obtain an unctuous composition which will be fluid at a low temperature, and combines tallow or oil with water for this purpose, by means of an alkali, in such proportions, that it shall not possess any caustic or alkaline properties prejudicial to the metal bearings with which it is in contact, and recommends the following for the axles of locomotive engines, and the principal bearings in a manufactory: —To a solution of half a pound of common soda in a gallon of pure water, mix three pounds of clean tallow and six pounds of palm oil in a covered vessel, at a temperature of 200° or 210° of Fahrenheit, the whole to be well stirred together until it has cooled down to about 60°.

For wooden bearings, pulleys, or inclined planes, he mixes with a gallon of the above solution one gallon of rape oil, and one gallon of tallow or palm oil, in the manner above described.

In conclusion, the Patentee states, that he does not limit himself to these exact proportions, as they may be varied to suit the weather, or the speed of the rubbing surfaces, as the person having charge of the machinery shall find best adapted to his particular purpose. —[*Inrolled in the Inrolment Office, June,* 1835.]

To WILLIAM SIMPSON, *of Evesham, in the county of Worcester, jobbing smith, for his invention of a safety drag or lever slide for carriages.*—[Sealed 9th May, 1835.]

FIG. 12, is a side view of the drag, complete, shown in action: *a*, is the axletree of the carriage; *b*, *c*, a bent lever, which is suspended by and works in a joint fixed on the axletree as its fulcrum. Attached to the lower arm *b*, of this lever, is a foot *d*, constituting the drag or stop: the other end, *c*, is drawn up by a chain or winding strap on the excentric pulley *g*, on the spindle of which is fixed a similar pulley *h*. The end of another chain or strap *n*, is fastened to the pulley *h*, and passes under and over the two small sheaves or pulleys *i*, and *j*, into the required direction, to the barrel or drum *k*, which is to be placed in the situation most convenient to the person having charge of the carriage; *l*, is a pedal lever, connected with a ratchet stop to the barrel *k*; *m*, is a spring or springs of sufficient force to press down the arm *c*, and counterbalance the weight of the arm *b*, and foot *d*, when out of use; *f*, is a guide for the arm *c*, of the lever to slide in. To enable the lever *b*, to resist any strains or shocks to which it may be exposed sideways, there is a rod connected to the lower part, and attached at the other end by a joint to the axletree, enabling it to move freely with the arm *b*.

The action of the drag is as follows:—The foot of the conductor being placed on the pedal *l*, to bring the ratchet into operation, the chain or strap *n*, on being wound round the barrel *k*, by means of a winch handle attached thereto, draws up the end *c*, of the lever *b*, *c*, and brings the arm *b*, into a more perpendicular position, according to the force exerted in proportion to the resistance required, tending to raise the axletree *a*, together with the wheels, the shoe or foot *b*, acting as a drag or stop upon the carriage. On the ratchet being released by taking the pressure off the pedal *l*, the spring *m*, forces the lever and drag stop into the position shown by dots.

The Patentee remarks, that the foot *d*, being liable to wear, should be capable of being taken off to repair, or to be exchanged for one adapted to the state of the road, as in frosty weather, for instance, it would be advisable to make them with studs or projections on the under side to increase the adhesion ; and he further observes, that for railroads, and carriages with considerable speed, two drags, one on each side, will, perhaps, be found necessary.—[*Inrolled in the Inrolment Office, November*, 1835.]

To APSLEY PELATT, *of Falcon Glass-works, Holland-street, Blackfriars-road, in the county of Surrey, glass-manufacturer, in consequence of a communication made to him by a certain foreigner residing abroad, and partly discoveries by himself, for an invention for an improved mode of forming glass vessels and utensils with ornamental figured patterns impressed thereon.*—[Sealed 9th March, 1831.]

THIS invention consists in forming ornamental patterns on glass vessels by means of cakes made of plaster of Paris, and other ingredients. The manner of performing this is as follows:—In the interior of the common metal bottle mould, which is now in general use for making of glass bottles, a recess is formed for receiving the cake or pattern which the glass utensil is desired to have, either sunk or in relief upon the face of the said glass utensil. These cakes are put in the mould in a red hot state, and then the glass is blown into the mould, and receives the pattern from the said cake. When the glass utensil is sufficiently cooled, the mould is then opened, and whatever part of the clay or other earthy matter of the cake may still adhere to the article, may be easily removed. Of course, a fresh cake or pattern is used every time any article of the same description is made. Now, if a great number of the same article be wanted to be made, it is evident that the manufacturer must have some expeditious way of making the cakes or patterns. This he does in the following manner:—If it is required to make an imitation of an ancient vase, then an exact pattern of the vase is first modelled, and a cast taken of that in type metal. When this cast is taken, the impression is cleared out by an engraver or chaser, who makes all the lines sharp and well defined, and then the metal mould is ready for use. The ingredients of which the cakes or patterns are composed, are of the following description and quantity for the exterior of the cakes, or that part which is put into the recess in the mould for manufacturing the glass articles:—Equal parts by weight of fine plaster of Paris and finely pounded brick-dust is used, and for the facing of the cake equal parts of very fine plaster of Paris and finely pounded rotten-stone. These several ingredients must be very intimately mixed in a dry and pounded state, and then sifted through very fine lawn, after which the ingredients must be made into a thick paste, by the application of water sufficient to make the several particles adhere together: then this mixture is forcibly crammed into the metal mould, from whence it is taken with the pattern thereon. The cake is then perfectly dried, in order to expel any moisture therefrom; after which it is heated red hot, and in that state it is fit for use, as before described.—[*Inrolled in the Petty Bag Office, September,* 1831.]

To PETER WILLIAMS, *of Hlywell, in the county of Flint, surgeon, for his having invented an apparatus or contrivance for preventing accidents in carriages, gigs, and other vehicles, by instantly and effectually liberating horses or other animals from the same when in danger, or otherwise, and for locking and securing the wheels thereof in cases of danger, emergency, or otherwise.*— [Sealed 7th September, 1830.]

ON the five inventions specified under the above title, the Patentee seems to have exhausted his ingenuity by describing their application in every possible shape, illustrated by drawings to scale of upwards of forty different figures.

Fig. 13, Plate VIII., represents a break clip or friction band applied to the nave *b*, of a wheel; *a*, *h*, is the clip or band in two parts, jointed together by a hinge joint at *f*, and having a nut *g*, on one end; *c*, a spindle or rod, passing through the end *a*, of the clip, and confined there by a nut on the outside, having a worm or screw working in the nut *g*. To the end of this rod is affixed a handle *d*, placed in any convenient situation. At *e*, is the fulcrum pin, to which the clip is fastened to the axletree. On the handle *d*, being turned, the two ends of the band or clip will be brought nearer each other, and forced or pressed on the nave, by means of the screw or worm, on *c*, working in the nut *g*, the friction retarding the rotation of the carriage wheel. By reversing the handle *d*, the clip is released out of action. Fig. 14, is the same clip or band, brought into action by means of a bent lever *d*, working in a fulcrum *c*, on the end of the arm *h*, of the clip, and connected with a hook at the other end of the clip by a link or joint-piece *i*. The end of the lever being pressed down, brings the clip into operation upon the nave of the carriage, as shown in the figure. When out of action, the lever and joints assume the position shown by dots.

Another break, operating upon the circumference of the wheel, as shown at figs. 15, and 16, in which *a*, is the carriage wheel; *b*, the axletree; *c*, *c*, are short projecting arms, to which is attached the break *d*, *d*, by pins, on which it turns as a centre. While out of use, the break is supported nearly perpendicular by a rein or cord *e*. To bring it into action the cord *e*, is loosed, and the break falls into the position shown by dots at *f*, in fig. 15, the progression of the carriage serving to bind it firmly to the tire of the wheel.

Fig. 17, is an apparatus to be used in case of the horse becoming restive, and backing: *a*, is the nave of the wheel; *b*, a ring of wrought-iron firmly fixed to the same, on which three strong projections or ratchet teeth are forged; *c*, is a pall, held in its present position by a cord *e*, which being released, the pall descends, and catching one of the studs *b*, prevents the wheel from revolving.

The apparatus or contrivance for liberating the horses is delineated in figs. 18, and 19, in which *a*, is a rod or spindle, extending from one side of the carriage to the other, and supported and working in bearings fixed on the framework; *b*, is an arm, projecting from the rod *a*; *c*, is an "anchor head" at each trace, to which the pin or bolt *d*, confining the joint *f*, is attached; *e*, is a cord or rein, which, on being pulled, as shown in fig. 18, depresses the arm *b*, and withdraws the bolt *d*, releasing the joint *f*, and liberating the trace *g*, with the horses from the carriage. Several modes of effecting the requisite motion of this apparatus by levers, instead of the cord *e*, are shown, and as applied to different descriptions of vehicles, or to one or more horses, and also for releasing the collar and belly-band simultaneously with the traces; but as these do not present any novel features, we do not think it necessary to insert them.

On the horse being released from gigs and vehicles of a similar description, the shafts would fall on the ground and be liable to be broken, and those in the vehicle thrown out; to prevent this, the Patentee proposes to attach to the bottom of the gig a prop, of the shape shown in fig. 20: *a*, *b*, being a jointed bar, the upper part of which is fastened to the vehicle, while the lower end *b*, is suspended horizontally, and let fall at the same time the horse is released, by being connected with the apparatus last described. The sliding piece *c*, (drawn on the upper portion to show the joint) slips down over the joint, making the bar an inflexible prop to support the shafts of the gig. At the fork, at the lower end of the prop, are two small wheels or rollers, to prevent the too sudden resistance and stoppage of the vehicle.

The Patentee concludes his specification by saying, that he does not claim any part of the above apparatus which may have been in previous use, but claims the combination of the various parts herein set forth, and applying them so combined to the purposes and manner above described.—[*Inrolled in the Inrolment Office, February,* 1831.]

To WILLIAM BICKFORD, *of Tucking-mill, in the county of Cornwall, leather-seller, for his having invented an instrument for igniting gunpowder, when used in the operation of blasting rocks and in mining.*—[Sealed 6th September, 1831.]

THIS invention of an apparatus for igniting the gunpowder used in blasting rocks, consists of a cord or rope made of flax, hemp, wool, or any other fibrous substance, in the interior of which there is a quantity of gunpowder, or any other combustible substance in close contact, in a continuous line throughout the whole length of rope or cord, so as to form a continuous fusee. The mode of manufacturing this cord with the gunpowder, or other combustible substance, inside, in a continuous line throughout the whole length, will be better understood by reference to the drawings in the accompanying Plate.

Fig. 21, Plate VIII., represents a section of the apparatus used for manufacturing the said cord, so as to form a continuous fusee: *a, a,* are the yarns of hemp, flax, or any other fibrous substance, which compose the cord or rope, which yarns are drawn (as the process of making the cord goes on) over a guide rail *b*, of wood or cane, from cans situated below; the threads or yarns are then passed through holes *c*, which are made in an inverted cone *d*, and which holes converge to the lower or smaller end of the cone, and by this means the threads are brought all together at the bottom of the said cone, where they are twisted or spun into a cord or rope. As this process of spinning goes on, the gunpowder, or other combustible substance, is dropped into the centre of the cord (just at the point at which all the threads are spun into a rope or cord), which is done by means of a funnel *e*, supported by pillars, as shown in the figure; which funnel contains the gunpowder, or other combustible substance. The gunpowder, as it is used by the cord, runs through the funnel and down the pipe *f*, which is made through the centre of the inverted cone *d*, and which comes directly down to the junction of the threads to make a cord or rope.

It will now be seen that as the gunpowder, saltpetre, or other combustible substance, runs from the funnel *e*, and down the pipe *f*, of the inverted cone *d*, it is taken up and used by the threads in the process of spinning.

It may now be asked by some of our readers, how this process of spinning is to be effected. The way in which this operation is performed, is by means of a wharve whirl or pulley, which is fastened on to the end of the cord; but we do not exactly see how the cord is to be spun, as it is evident that the spindle cannot twist the cord past the angle that it makes in passing under the pulley *g*.

The Patentee proceeds to state, that after the fusee is made, by the process before described, the fibres are then made to lay close to prevent any of the gunpowder from escaping, by bathing the cord or rope in a bath of hot varnish. This process also answers the purpose of preserving the gunpowder from damp, &c., which would otherwise defeat the intention of the inventor.

The Patentee observes, in conclusion, that when it is required to cut the fusee into any certain length, the end which is cut ought to be bound round with thin twine, to prevent the escape of the gunpowder.—[*Inrolled in the Inrolment Office, March,* 1832.]

To EDWARD BOYS, *junior, of Rochester, in the county of Kent, gentleman, for his invention of a machine or apparatus for preventing accidents with carriages in descending hills, or in other perilous situations.*—[Sealed 4th April, 1833.]

THE improvements, specified under the title of this invention, consist in the application of certain arrangements of apparatus to the axle of different descriptions of vehicles, by which means a person is able to obtain friction sufficient to retard the progress of the carriage, without the necessity of stopping it for that purpose. The particular improvements specified by the Patentee, as adapted to a four-wheeled carriage, are more particularly shown and described in Plate VIII., fig. 22: *a,* is the skid-pan, on which rest two arms or levers *b, b,* the upper ends of which levers come to a point at the fulcrum *c,* in the end of a long lever *d,* which long lever has its fulcrum at *e,* and which fulcrum is fixed in a bearing attached to the axle to the upper end of the long lever *d,* a chain strap or band *f,* is attached and connected with the roller or windlass *g*; and from this roller or windlass *g,* there is another strap or band *h,* attached to a short arm at the end of the long lever *d.* The roller or windlass *g*, turns on a pin, which is fixed in the hinder part of the carriage, and may be turned by any person that is near it; or, instead of placing the windlass behind the carriage, it may be situated in a place convenient for the coachman, who can (when the carriage is about to descend a hill) place the skid in its proper position for retarding the progress of the carriage, without the necessity of getting down or stopping the vehicle. It should be observed, that the roller or windlass *g*, may be of any diameter to suit the difference of the length through which the straps *f*, and *h*, have to pass. It will now be evident, that in the event of the guard, or other person, wishing to retard the progress of the carriage in case of descending a hill, or the horses running away, he has only to turn the windlass *g*, which will bring the skid down, and cause it to press on the ground, and by this means gradually raise the carriage off the ground; and when it may be required to set the carriage in full motion again, that may be effected by turning the windlass the contrary way, which will raise up the skid, and thus release the wheel, which will then revolve freely on its axle. The Patentee proceeds to describe another arrangement, differing chiefly in the manner of combining the long lever *d*, and the descending arms or levers *b*, *b*. The lever *c*, in this instance, stands at right angles to the wheel, instead of being parallel to it; as it is in the preceding figure, this lever turns horizontally on its fulcrum. At one end of the lever is formed a toothed rack, which gears into teeth of a circular plate, which turns freely on the axle of the wheel, the descending arms being attached to this plate by a pin, are worked in a similar manner to the corresponding levers, as in the preceding figure.

The Patentee concludes by stating, that what he claims as his invention, is "the combining and affixing the common jack" or lever movement, having the skid or shoe, as above described, and actuated by the bands or straps connected with a windlass or roller, to be fixed at any convenient position of the carriage, where it may be desired to be acted on either by the guard, the coachman, by any other person in the vehicle, or by the postilion, having in that case the roller affixed to the pole, depending only on the position of windlass or roller *a*."—[*Inrolled in the Inrolment Office, October,* 1833.]

To THEODOR SCHWARTZ, *technologist, formerly of Stockholm, but now of Bradford-street, Birmingham, in the county of Warwick, for his invention of a practical application, or practical applications of known principles, to produce mechanical power.*—[Sealed 24th August, 1835.]

THIS invention consists in adapting the elastic force of any gas to the working of engines, in a manner somewhat similar to that in which steam is now applied to the steam-engines now in ordinary use. The manner in which the Patentee converts the expansive force of the gas to any use, is by causing water or any other liquid to absorb a certain quantity of the gas, which he does by confining the water in a close vessel, and forcing as much gas into the vessel as the water is capable of absorbing. The Patentee here observes, that it is not of any material consequence what gas is used, but that he prefers for this purpose muriatic acid gas, because it is more readily absorbable by water, and the water will, when required, allow that gas to escape from it with greater facility than any other.

The Patentee then goes on very learnedly to state, the exact quantity of gas that a foot of water, or any other liquid, is capable of absorbing under a high pressure; and he finds that a foot of water will absorb about eight times its bulk of muriatic acid gas, or about eight feet; and he founds his statement upon the authority of Priestly, Thomson, and Dr. Ure, from which several eminent chemists he favours us with extracts in support of his opinion. He then proceeds to describe the manner in which he applies the gas to the engine; which description, in order to be quite correct, we shall give as near his own words as possible. And, firstly, a wrought-iron reservoir, of suitable strength and capacity, for containing the liquid and the compressed gas, must be provided with pipes, having slide or other valves. These pipes must connect the reservoir with the top and bottom of a cylinder, which has a piston accurately fitted in it: the end of the piston rod is connected with the crank-shaft, as in the common steam engine. From the reservoir containing the compressed gases, a communication with the cylinder through the pipes is opened or closed at pleasure by valves. Upon opening the communication between the reservoir and the bottom of the cylinder the gas rushes in, and by its expansive force raises the piston. After a sufficient quantity of gas has passed into the cylinder, the communication between the reservoir and the cylinder is closed. A jet of water, which is obtained from a tank connected with the engine, is then thrown into a condenser, which is in connexion with the cylinder; the gas which has raised the piston is absorbed by the water, and a vacuum is formed between the bottom of the piston and the bottom of the cylinder. The communication from the reservoir to the top of the cylinder is then opened, and a sufficient quantity of gas is allowed to pass into the cylinder above the piston, in order to give the piston a downward stroke. The gas, after it has depressed the piston, is in its turn rapidly absorbed by the application of a jet of water, acting, as before stated, in the condenser, and causing a vacuum between the top of the piston and the top of the cylinder. A communication is then opened, as already described, between the reservoir and the bottom of the cylinder; and the piston is alternately raised and depressed by the same mechanical motion as those of the double-acting steam engine, which are too well known by every practical man to require further description. The jets of water, after they have acted in the condenser, and caused a vacuum by absorbing all the gas, pass into a proper receiver connected with the condenser. The gas contained in the water of the receiver may afterwards be separated by a gentle heat, or other means, and be again compressed into water in a proper reservoir. In this way the same gas may be employed repeatedly in giving motion to the engine, or, in other words, may be used over and over again in working the engine. The quantity of gas compressed into the reservoir must be proportioned to the power which the engine is required to exert, and to the time during which it exerts its power. When the action of the engine raises the piston, the reservoir and the receiver, and all their contents, must be removed, and be replaced by others, which can be attached immediately.

The Patentee concludes by stating, that he claims as his invention a practical application, or practical applications of known principles, to produce mechanical power, the application for this purpose of such gases as are rapidly absorbed by water or other liquids. The Patentee here states, that he gives a preference to ammonia; firstly, because it is as easily obtained; secondly, because it is readily absorbed by water; thirdly, because it is readily disengaged from water, or other liquids; and, fourthly, because it has no deleterious qualities which would deteriorate the iron.—[*Inrolled in the Rolls Chapel Office, October*, 1835.]

To THOMAS DUNKIN, *of Bordeaux, in the kingdom of France, but now residing at No. 2, Trinity-place, Charing-cross, in the parish of St. Martin-in-the-Fields, and county of Middlesex, late officer in the* 18*th Regiment of Hussars, for certain improvements in the mode, method, or system of obtaining or producing duplicate copies of manuscripts, writings, and drawings, and in the apparatus or machinery used in the same.*—[Sealed 13th May, 1835.]

THIS invention of certain improvements in the mode, method, or system of obtaining or producing duplicate copies of manuscripts, writings, and drawings, and in the apparatus or machinery used in the same, consists, first, in an improved method or system of obtaining duplicate copies or impressions of writings, or pen and ink drawings, plans, or etchings; and, in the second place, in an improvement in the construction of the press or apparatus used in the same, to enable duplicate copies or impressions to be taken or made with greater facility on the leaves of a bound book. The first improvement, viz. the improved method or system of obtaining the duplicate copies, is as follows:—

The manuscript writing, drawing, plan, or etching, in the first instance, is made with a pen on ordinary writing, or other paper, or on any other proper smooth surface, with ink (such as hereinafter described), or a gummy liquid, not susceptible of drying immediately: this writing, or drawing, is then to be transferred before it dries by pressure on to another perfectly smooth surface (such as hereinafter mentioned), capable of taking the ink or gummy writing or drawing from the first paper. The now transferred writing or drawing is then to be covered with an impalpable ink powder (such as hereinafter described), capable of absorbing the exterior dampness of the transfer, and should be black or coloured powder, or such as will be so when wetted or melted by the dampness of the transferred writing or drawing.

This covering of the writing or drawing with the powder, may be done by shaking it over the transferring surface, the powder remaining only on the lines of the transfer or drawing; the surplus powder is then removed from the transferring surface with a light brush, which takes off all that does not adhere to the lines of the transferred writing or drawing. After this is done, the transfer is damped by breathing over it, or otherwise, by which the powder will become liquid, or nearly so, and form the ink for giving the duplicate copy or impression. The sheet of paper, or other material intended to take the impression, is then laid upon the transfer, or the transfer upon it, and both are subjected to pressure by passing them through a double roller, or other press; and by this means the damp ink powder is transferred to the sheet of paper, and the first duplicate copy or impression is obtained. The transfer is again to be powdered, and the surplus removed, then again damped, and a second sheet of paper placed in contact with it, and a second duplicate copy or impression taken; and the same way for a third, fourth, and so on, at each duplicate copy, following the same proceedings. When the gummy transfer fails in taking up sufficient ink powder to produce a perfect impression, it may be rubbed out, or cleaned off the transfer surface with a sponge and water, and the same surface again used for another transfer.

And in order that this improved system or method may be better understood, we shall more minutely and particularly describe the ink and powder used therein, and also the process of producing the duplicate copies.

The manuscript writing or drawing is first produced by a pen with a prepared ink, made as the ordinary writing ink, such as 200 parts of water, 15 parts gall nut, 15 parts sulphate of iron, 10 parts of common sugar, 12 parts gum arabic. To 18 parts in weight of this ordinary ink, add 6¼ parts of sugar candy, 2½ parts of deliquescent salt, such as marine salt, hydrochlorate of lime, chlorine, or calcienne, &c.

Having written a page, or produced a drawing on a sheet of paper, or other material, with this prepared ink, place it on a water-proof varnished or polished oiled silk or skin, or other proper surface, laid on the bed-board of the press, the writing or drawing being placed next or in contact with the smooth surface of the said oiled silk or skin; a double cloth, or a smooth card board, is then to be placed on them, and the whole passed through the press behind the rollers, by which the writing or drawing will be transferred from the paper on to the oiled skin or silk, or other smooth surface in reverse. An impalpable powder, intended to form the ink for making the duplicate copy or impression, and composed of colouring ingredients according to the colour desired, is then passed over the oiled skin or silk, or transferring surface, for example:—For black line writing or drawing, the powder may be composed of sulphate of iron, or the acetate of iron, gall nut, or gallic acid, sugar candy, and lamp black, the portions being varied according to the intenseness of the colour, or the number of duplicate copies wished to be obtained, for example:—1 part lamp black, 27 parts sulphate of iron, 13 parts gall nut, 60 parts of powdered sugar candy, will make an ink powder capable of obtaining several copies of ordinary writing. The powder being passed over, the transferred writing or drawing adheres to it, and with a light long-haired brush the oil-skin is swept gently, to take off the superfluous powder, or that which does not stick on with the transfer. The powdered lines or transfer is then dampened by breathing over the whole surface of the oil-skin until the lines appear black, and are damp; or the same effect may be produced with more regularity by using damped linen stretched over a board, or on a sheet of metal with the edges turned up, and slightly wetted with a sponge, such plate or linen being placed over the oil-skin or silk, or transferring surface, the edges of the plate of metal, or board preventing its touching the surface of the transfer, but allowing the powder to take the dampness thrown out by the linen or metal plate. When the transfer is sufficiently damp, the paper intended to take the duplicate copy is placed in contact with it, and they are passed through the press, and a first duplicate copy of the original manuscript is taken. The transfer is then again immediately powdered, swept, damped, and then passed through the press for a second copy, and so on, repeating the system each time according to the number required, or that which the transfer will give. Afterwards wash the varnished oil-skin, or transferring surface, with a wet sponge, and it is ready to take another transfer.

The second improvement, viz. in the construction of the press for producing duplicate copies on the leaves of a bound book, consists in the application of a rod supported in ears or notches in front of the bed-board of the press, which rod is to be passed through the hollow back of the book, to support it while the impression is being taken.

The rod is placed within the hollow of the back of a book, and supports the book open in front of the press, so that the leaf on which the impression is to be taken may be laid upon the bed-board in the same way as a single sheet, there being notches or recesses in the supporters to allow the rod and book to be brought sufficiently near to the rollers to take the impression up to the inner extremity of the leaf.

In conclusion, the Patentee remarks, that by this improved method, ordinary paper may be used to operate upon in single sheets or in books without spoiling the original manuscripts or drawings, and without the necessity of wetting the paper. When copying into bound books, the rod is passed through the hollow back of the book, and then placed in the hooks, the book hanging down. The page or the leaf intended to receive the copy or impression is then laid on the transfer, placed on the bed-board, and the whole is then passed forward and backward between the rollers, and the impression is obtained.

And, lastly, the Patentee wishes it to be understood that he does not claim any of the parts of the improvements separately, or the construction of the copying press or machine, as that is not new, and forms no part of these improvements; but he does claim the improved mode, method, or system of obtaining or producing duplicate copies of manuscript writings and drawings hereinbefore particularly described, and also the addition of the rod to the bed-board of the press, for the purpose of facilitating the production of such duplicate writings or drawings in bound books.—[*Inrolled in the Rolls Chapel Office, November*, 1835.]

Specification drawn by Messrs. Newton and Berry.

To JOSEPH CLISILD DANIELL, *of Tiverton Mills, near Bath, in the county of Somerset, clothier, for his invention of an improvement or improvements in the process of manufacturing or preparing woollen cloths.*—[Sealed 25th September, 1834.]

THE improvements specified under the title of this patent, consist in passing the woollen cloth in the moist and soapy state in which it is when it comes from the fulling or milling operation, between what the Patentee calls pressing rollers, for the purpose of laying and smoothening the fibres of the cloth, and also for the purpose of pressing out any wrinkles or irregularities in the cloth. The Patentee, in his specification (most part of which is a very long and laboured description of what has been known long before to any practical man), describes two modes of applying his invention. The first is, the pressing or rolling machine only; to which machine the cloth is brought after it has undergone the operation of gigging, or a process for raising a nap or pile on the cloth. The next machine which the Patentee describes, is an adaptation of the former to a common gig machine. In this machine the cloth undergoes the process of gigging first, and then, as the gig barrel revolves, it delivers the cloth to the pressing rollers, and from thence, after the pressing process, it is wound on to a wooden roller in front of the machine.

We have not thought it necessary to give a drawing and description of the former machine, as all its parts are included and well represented in the drawing of the latter machine, which is merely an adaptation of the pressing process to a gig machine, as before mentioned.

Fig. 23, Plate VIII., is a vertical section of a gig machine, with the pressing rollers adapted thereto: *a*, is the gig barrel, constructed with teasles or wire cards, as may be thought most convenient; *b*, is the delivery roller; *c*, is what the Patentee calls the under pressing roller; *d, d*, the upper pressing rollers, with weighted levers *e, e*, to cause the rollers to press with some force upon the cloth. The weight with which these levers press upon the cloth may be varied at pleasure, by moving the weights *f, f*, on the levers *e, e*, further from or nearer to the fulcrum of the said levers; *g*, is the breast beam, over which the cloth passes from the gig barrel to the pressing rollers, and which is fluted for the purpose of distending the cloth. The cloth is brought to this machine direct from the fulling stock in its soapy and moist state; and in order that it may not get too hard and dry, a steam or water pipe *h*, is affixed to the machine, with suitable cocks to regulate the supply of steam or water; and from this pipe, should the fabric require it, small jets of steam or water may be flashed upon the surface of the fabric: *i*, is a roller, on to which the cloth is wound when it has gone through the whole machine. Rotary motion is given to the machine by pulleys situated on the principal driving shaft *k*, and which shaft is also the axle of the roller *c*, and which is set in motion by a steam-engine water wheel, or any other first mover. The motion of the driving shaft K, being communicated to the rest of the machine by suitable gear work, which gear work is removed in order to show the machine in section, but the size and number of the wheels required will be readily understood by any practical man that is conversant with this sort of machinery.—[*Inrolled in the Inrolment Office, March*, 1835.]

To JOHN SUTTON NETTLEFOLD, *of Red Lion-street, Holborn, in the county of Middlesex, ironmonger, for his having invented an improvement or improvements in table furniture, applicable to other purposes.*—[Sealed 6th February, 1832.]

THIS invention consists in manufacturing the fastenings of tables of a peculiar construction, and also in rendering the said fastenings applicable to various other purposes, such as window sashes, shutters, the partitions of apartments, and in putting up platforms and various other work. By this construction of table fastenings, the flaps of the table or other work that is required to be held together are brought into close contact, and held so by the arrangement of wedges, as will be hereafter described. In Plate VIII., fig. 24, is a plan view of that part of the improved fastening which is intended to be attached to the table, by means of screws or any other suitable contrivance: *a*, is an oblong piece of metal, shown also in the other figures 25 and 26, having a wedge-shaped piece of metal *b*, fastened on to the top of it; this wedge-shaped piece of metal does not lie close to the oblong piece *a*, but has a recess between it and the piece *a*, shown more clearly at fig. 25, which represents an end view of the apparatus complete: this recess is for the purpose of admitting the corresponding pieces of metal *c*, on the bridge-piece *d*, and thus bringing the table-flaps together by the pieces *c*, pressing against the sides of the wedge-shaped pieces *b*, as will be more clearly understood by reference to fig. 26, which represents a perspective view of the improved table fastening attached to the two flaps of a table, and which fastening holds them together by the metal pieces *c*, on the bridge-piece *d*, being pressed against the outer edges of the wedge-pieces *b*, and thus forcing the inner edges of the oblong piece of metal *a*, close together, and by this means preventing any unpleasant shaking. The Patentee proceeds to state, that the principal difference between his improved fastening and those at present in common use is, that by his improved fastening, the flaps of tables, or any other work that is required to be held tightly together, may constantly be kept in close contact by pressing forward the bridge-piece *d*, which draws the flaps closely together; whereas, in the common forked fastening, now in ordinary use, the forks are liable to wear by use, and then they will not keep the table-flaps or other work together, but will allow them to shake; and the forks are also liable to be strained or forced apart; and they are also liable to be damaged by other furniture knocking against them, by their being placed in the exposed situation in which they generally are; whilst this improved fastening is entirely out of the reach of any accidental damage, by its being placed altogether under the table. If the improved fastening should, at any time, get loose or shaky, all that is required to be done is to press the bridge-piece further along the groove, as far as it will go, and the whole is immediately as rigidly secure as ever. The Patentee states, that there are many ways of manufacturing his improved fastening, but still observing the same principle, viz. that of the wedge-shaped pieces, and that, therefore, he does not confine himself to the exact shape and form of that shown in the drawing; and he concludes by stating, that he claims as his invention the adaptation of wedge-shaped pieces, by means of which the two flaps of the table, or other article, are gradually brought together, and held there in close contact.—[*Inrolled in the Inrolment Office, August,* 1832.

To SAMUEL MORAND, *of Manchester, in the county of Lancaster, merchant, for his invention of improvements on his improved stretching machine, for which he obtained Letters Patent the* 14*th day of April,* 1831.—[Sealed 12th April, 1834.]

IN order to render more intelligible the description of this invention, the Patentee describes the whole machine comprising his improvements, and this present invention may be distinguished from his improved stretching machine, for which letters patent, dated the 14th day of April, 1831, were granted to him, by comparing this invention with the specification which was inrolled in the High Court of Chancery on the 12th day of October, 1831, and a full description of which will be found in vol. viii., Second Series, p. 137, of the London Journal of Arts and Sciences.

The Patentee proceeds to describe his invention in the following manner:—Fig. 1, Plate IX., is a horizontal plan of the machine, in which a piece of cloth, or other fabric, is represented as passing through the machine. The dotted lines in this figure indicate the situation of parts which cannot be seen in this view. Fig. 2, is a longitudinal sectional elevation of the said machine, together with certain accessary parts, consisting of a series of cylinders and a series of rollers for conducting the fabrics to be stretched to the stretching chains, and also an apparatus for drying the same fabric. Fig. 3, is a transverse sectional elevation of the said machine, and shows the positions of the chain rails and adjusting screws, and also the flues of the accessary apparatus for drying the fabric. Fig. 4, is a horizontal plan of the principal constituents of that part of the machine at which the fabric to be stretched is introduced, and of that part along which it receives a progressively increased degree of stretching. To avoid crowding the figure, and also to show the situation of the parts lying beneath others, some portions of the apparatus are represented as broken off, and others indicated only by dotted lines.

The same letters or numbers of reference are employed to designate similar parts in all the figures; and in order to avoid in the following description the multiplied use of the same letter or number of reference, when referring to several similar or corresponding parts marked with the same letter or number in the figure or figures in which they occur, the Patentee states, that by reference to any single letter or number, he intends to refer to and designate all the parts (if more than one) marked therewith in any figure or figures in which the same occur.

This machine, as now in use, is set up in a fire-proof building, of which the parts marked A, are the external walls: B, the ground floor: C, the first floor above; on this first floor the machine is placed: D, the second floor above, forming the roof or ceiling of the room in which the machine is placed; E, E, partition walls, which together with the floors C, and D, and the side walls, form a stove for drying the fabric, as it passes through the machine; G, is a furnace for heating the stove, and communicating with the flue H, which passes through and along the machine, and has its outlet through the transverse flue I, formed in the said first floor, and at the chimney of which a section J, is shown in fig. 1; K, fig. 2, is a flue formed in the brickwork of the furnace G, and receives the external air through the opening L. The air being heated in its passage through the flue K, is received into the flue M, formed under and separate from the smoke flue H. The flue M, is further supplied with heated air from a range of pipes N, receiving the external air, and passing through the top of the furnace into the flue M. The heated air thus collected into the flue M, passes upwards, through a series of cast iron pipes O, the situation of which is designated by the dotted parallelograms in fig. 1, and vertical sections of which are shown in fig. 2; these admit the heated air into the upper flue P. This flue receives a further supply of steam through a steam-pipe Q. The upper surface or cover of the flue P, as constructed, now consists of plates of sheet iron R, joined together, and which are closely perforated with small holes, through which the heated air and steam issue against the under surface of the fabric as it passes through the machine; some of the perforations are seen at S, in the cover R, in fig. 1: T, are the sides, and T 1, are the ends of the frame of the machine, within which frame the several flues already described are enclosed, and the iron plates, or other metallic materials, forming the flues, are attached to the sides T, in the usual way, by bolts and flanges. To the sides T, are fixed externally the several pedestals U, for carrying and supporting the several right and left hand screws V, X, Y, Z, and the driving shaft *a*, which receives motion from the steam engine, or other first mover, by bevel wheels, or any other suitable means. Within the said side frame T, at the end of which the fabric is introduced, is a smaller frame *l*, carried on pins sliding in boxes fixed to the sides T. On the frame *l*, a series of small iron rollers are mounted. The frame *l*, may be moved or traversed transversely between the side frames T, to the extent of about two inches, by means of a pinion *m*, and rack *n*, seen in fig. 4, and worked by a segment handle *n* 2. At the other end of the machine is also carried by the frames T, a doffing roller *q*, which is covered with cards of the sort commonly used in carding cotton, and receives motion from the driving shaft *a*, by means of an endless strap. The doffing roller *q*, may be raised or lowered in its carriers, as may be necessary to doff the cloth properly from the pins of the stretching chains. Beneath this doffing roller *q*, is a second and smaller doffing roller *r*, made of wood, tin, or other suitable material, and made to run much quicker than the doffing roller *q*, by means of a train of spur wheels: *v*, is a long wrought-iron shaft, supported also by brackets and steps; from one of the side frames T, it receives motion from a mitre wheel *w*, fixed on the end of the driving shaft *a*, and which wheel *w*, works into the two corresponding mitre wheels *x*, and *y*; by means of which mitre wheels *x*, and *y*, and the double catch box *z*, the shaft *v*, may be made to turn either way round. The use of the shaft *v*, with its double motion, is to move, by means of four pair of mitre wheels, the right and left hand screws V, X, Y, either to the right or to the left; and by means of the spur wheels which drive the right and left hand screw Z, to cause the boxes or nuts 6, 6, on the screws to approach the centre of the machine, or to recede therefrom. The spur wheels are fixed one on the end of the screw Y, the other on the end of the screw Z: 8, are a pair of rails attached to and carried by the said boxes or nuts, and extending from the driving shaft *a*, to the right and left hand screw Z, as seen in figs. 1, and 2. The inner sides and surfaces of the rail are made smooth and true from one end to the other, to admit of the endless chain, hereinafter described, sliding freely over the same when the machine is at work. The screw boxes or nuts, and the mode of attaching the rails thereto, are seen in fig. 3. Each of the rails has two joints or hinges marked in each rail respectively 9, and 10, which, by means of an elliptical hole in the middle knuckle of each joint, admits of that part of each rail included between the said joints being placed out of the right line, or at angles with the other parts of the rail.

The end of each rail is formed with a box or cavity to admit of the driving pulley 13, and the chain carried thereby revolving within it. The parts between the joint 9, and the driving shaft *a*, are also placed parallel to each other: 12, are two pulleys placed on the driving shaft *a*, and drive the endless chains. The driving shaft *a*, upon which the driving pulleys are placed, is made smooth and parallel from one end to the other, and has a small steel key or fillet let into its side, and standing out therefrom about a quarter of an inch, so that the pulleys placed on the said shaft may be made to traverse freely in the direction of its length, by means of a fork formed in the end of each rail.

These pulleys 12, are carried round with the shaft when in motion, by means of the steel key or fillet: The form of the chain pulleys is shown in figs. 5, and 6: the former of which represents a side view of one of the said pulleys, with the shaft *a*, and its key in section; and the latter, an edge view of the same, a segment of the upper part being cut away. Holes are sunk in the face or periphery of the wheel, to receive and hold the under projections or nogs of the links of the endless chain, and thereby to drive the said chain. At the opposite end of the machine are corresponding pulleys 13, of the same size and form of the pulleys 12. These pulleys are made to revolve on the screw boxes or nuts 7, which are placed on the right and left hand screw z; and, consequently, traverse along with the said boxes or nuts when the said screw is put in motion. The threads of the screw z, are cut in the opposite direction to the threads of the screw Y; so that although the screw Y, turns in an opposite direction to the screw z, by means of the spur wheels 7 *a*, 7 *b*, yet the boxes or nuts on both those screws advance or recede in the same direction; and as the right and left hand screw Y, is of the same pitch as the right and left hand screw z, consequently the screw boxes or nuts on the screw Y, traverse at the rate and parallel with the boxes or nuts on the screw z. Over each pair of the chain pulleys 12, and 13, and in the recesses of the chain rails 8, the endless stretching chains are placed, and made to revolve when the machine is in motion.

A portion of the chain is shown in figs. 7, 8, and 9: of which fig. 7, represents a side elevation; fig. 8, a transverse section; and fig. 9, a horizontal view of the same. The chain consists of short links, made of cast-iron, or other suitable metal. The form of the links will be best understood by reference to figs. 7, 8, and 9. The joint pins by which the links are connected are made to fit tight in, and are rivetted into the outer knuckles of the said links; but to fit loose in the middle knuckle of the corresponding link, the knuckles themselves having a little play in their jointings, in order to give to the said chain, when put together, sufficient lateral flexibility, to prevent its being strained or injured when passing the angles formed in the rails by the joints 9, and 10. Each alternate link has a projection or nog formed on its under surface, which is placed in and runs along the groove or race of the chain rail.

Screwed down to the upper surface of the links of the said chain are brass plates, (seen in fig. 9,) into which steel or iron pins, or needle points, are driven fast, protruding on the upper side to such length or height as is suitable to the thickness or quality of the fabric to be stretched upon the machine. The pins have a slight inclination, or leaning outwards, to give them a better hold on the fabric. The height of pins which I find most adapted to general purposes, is about one-eighth of an inch from the surface of the brass plate. In the course of their revolution, the chains pass over the driving pulleys 12, to the underside of the same pulleys; thence onwards to and over carrying pulleys, one of which only, marked 16, is seen, and which carrying pulleys are gooved, to admit of the passage of the chains over them without injury to the pins; thence onwards under the binding pulleys, one of which only, marked 19, is seen, which are grooved in their faces or peripheries to receive the nogs of the chains, and which binding pulleys may be pressed down by weights, so as to regulate the tension of the chains. To protect and support the endless chains in their return from under the driving pulleys 12, to the carrying pulleys 16, light railways 17, are suspended from the upper rails 8, by means of thin strips of hoop iron 18.

Over each rail are fixed the two pricking pulleys 31, and 32, by which the selvages of the fabric about to be stretched are pressed down and fastened on the pins of the endless chains; the periphery of the pulleys is formed of bristles, fastened in a metal rim, and supported on each side by brass plates, so as to make a moderately dense brush, the purpose of which is to force or prick the fabric on the pins of the chains. The pulley 31, is mounted on an axle carried by a sliding frame, which admits of the pulley rising when the cloth is doubled by the joining of two ends together, or any other occasion which requires it. There is also an adjusting screw formed on the end of the axle, upon which the said pulley revolves, by which the periphery of the said pulley can be placed exactly perpendicular over the pins. In order to keep close, as far as may be, the openings which are formed in the partition walls E, and F, to admit of the pair of rails 8, being set more or less apart, according to the width of the cloth under operation, a set of folding and unfolding iron shutters are made fast to the rails at the plain parts, and also to the sides of a frame which fits into the said opening in the partition wall; the wings 52, outside of the respective rails, being in an unfolded state, and the wings 53, between the rails, in a folded state. By these means, when the rails are set further apart, the inner wings of the shutters are more unfolded, and the outer ones more folded, and *vice versâ.*

Immediately above the openings for the shutters are the windows of the stove. A series of steam cylinders

20, may be heated by steam, but the heating thereof by steam, or otherwise, does not form any part of the invention. Over these cylinders the cloth passes in its way to the stretching machine. These cylinders are carried by a suspended frame 21, which frame, together with the said cylinders, may be moved or traversed in the direction of the right or the left of the machine above by means of the wheel handle 22, a pair of small bevel wheels working a short screw, and the plain grooved pulleys 25, in fig. 2, running in the short railway 26: 27, is a small roller covered with cards, over which the cloth is made to pass, and thereby receives a tension in its way to the steam cylinders and to the machine, by means of friction given to the card roller: 28, is a small roller to conduct the cloth from the steam cylinders through the long slot or opening 29, formed in the first floor of the building.

To perform the operation of stretching by the machine, if the cloth to be stretched is, for instance, twenty-six inches wide, and an additional width of four inches is wanted, then the distance between the parallel parts of the rails and chains included, in that part of their length between the driving pulleys 12, and the joints 9, must be set so as to give about twenty-nine inches and three-quarters from outside to outside of the chain pins across the machine. The short parallel part of the rails and chains included in the length from the joints 10, is then set to the ends 11, of the rails, to such a width as shall be from outside to outside of the pins, about a quarter of an inch less than the width of the fabric in its unstretched state; hence that part of the rails included within the distance between the joints 9, and 10, will not be parallel, but will diverge so as to form a regular increase in width from the short to the long parallel part of the rails, and in this state the machine is ready to receive the fabric to be stretched.

When the fabric is to be stretched, it must be in a damp state. If it has recently undergone the operation of stiffening, or other similar operation, by which it has been thoroughly moistened, it may have retained sufficient moisture from such operation, but, otherwise, water is used for stiffening or damping. It is then brought on to the platform 30, below the steam cylinders 20; it is then passed in the direction of the arrows, fig. 2, over the card roller 27, over and under alternately the steam cylinders 20, under the guide roller 28, through the slot opening 29, in the first floor, and over and under alternately the small rollers supported on the frame *l*. The fabric being brought to this point is taken by the attendant, who places the selvages evenly on the ends of the rails at 11, and under the pricking pulleys 31, where the chains with their pins first make their appearance above the rails, as they revolve over the chain pulleys 13. By this means the cloth is fastened on the pins by the pressure of the brush edges of the revolving pricking pulleys 31, and is carried forward by the chains and pins under the further pricking pulleys 32, by which the cloth is still more effectually secured on the pins. When the cloth arrives at this point the stretching commences, and continues progressively increasing throughout the length of the rail from this point to the joint 9, where the rails cease to diverge, and, consequently, no further stretching takes place. The fabric is thence carried forward along the remaining parallel parts of the rails, during its progress along which it may be dried by the application of heat in any suitable manner; but the application of heat forms no part of this invention.

When the fabric arrives at the end of the machine, where the chains descend over the driving pulleys 12, it is taken or stripped off the pins of the chains by means of the doffing roller *q*; and to prevent the fabric so taken off by the doffing roller from adhering to the cards, and being thereby carried further round by the same than is proper, the second small doffing roller *r*, is made to revolve at a quicker speed behind the fabric, as it descends through the slot opening 38, in the floor of the building, than the said card doffing roller. The fabric, as it descends through the said slot opening, is received into the room below on a table or roller, to be plaited or rolled up, as occasion may require.

Whilst the machine is in operation, an attendant at the front of the machine, where the fabric is received, takes care that it is presented, and continues to be presented, to the pins of the chains. If he finds that the short parallel parts of the rails from the joints 10, to the ends 11, have been set too wide or too narrow, he adjusts them by the following means, by which the right and left hand screws Y, and Z, can be turned at the pleasure of the attendant, independently of the means provided for turning those screws by the shaft *v*, namely:—In the first place, the connexion between the shaft *v*, and the screw Y, is suspended, by drawing a catch box out of gear with the adjacent wheel on the shaft *v*, so as to admit of the screws Y, and Z, being moved in the following manner:—37, is one of a pair of treadles, one of which is placed at each side of the machine and are mounted on pivots, of which the pivots 40, and 40 *a*, are shown (see fig. 4). The pivots belonging to the treadle 37, are placed in a corresponding manner on the opposite side of the machine. At the back end of each treadle, immediately under the centre of the screw Y, one end of the connecting rods is fixed with joints, attached to the outer ends of levers 41, and 42, (seen in fig. 4,) which levers ride freely upon the bosses of the fly wheels 43, and 44, which fly wheels are made fast to the screw Y; and upon the bosses of the said fly wheels the ratchet wheels 45, and 46, are fixed; and corresponding with the notches of the said ratchet wheels, a catch or pall is fixed to the outer end of each lever 41, and 42, together with the top end of the connecting rods already described; so that when the fore end of either treadle is pressed down towards the floor by the foot of the attendant, or otherwise, motion is communicated to the said screw Y. Instead of acting on the treadles by the foot, the same object may be accomplished, by turning either of the fly wheels 43, and 44, by the hand.

In case the fabric when brought to the machine is placed too much to the right or left of the centre of the machine, then instead of shifting the cloth on the platform 30, the person in attendance, by means of the wheel handle 22, and the traverse motion connected therewith, moves the suspended frame 21, more to the left or right, as may be required, so as to adjust the situation of the said frame, and consequently of the platform 30, and the fabric upon it, as may be necessary to bring the fabric evenly to the rails; but if a slight irregularity in the position or direction of the same piece of cloth or fabric as it comes from the small rollers on the frame *l*, to the rails should still occur, then, in order that the selvage of the cloth may not miss the pins as the fabric is delivered from the said small rollers, the attendant, by means of the segment handle *n* 2, and the traverse motion of the frame which carries the small rollers, moves the said rollers and the fabric thereon right or left, as may be required, until, by the adjustment of the steam cylinders and small rollers, the fabric attains the proper position or direction. In addition to the two lines of rails with their chains, already described, a third rail and chain 56, may be introduced, if thought fit, along the middle of the machine, in those cases where the fabric will admit of it without injury. When such third chain and rail is used, they must of course be accompanied with pricking pulleys, suspended on proper bearings over the rail. Where no third rail is to be used, the representation of such third rail and its adjuncts in the figures where the same occur, must be considered as omitted.

The Patentee then states, that "the proportions and materials of which the parts of the machine are to be composed, may be varied at the discretion of the constructor, according to the description of cloth or fabric to be stretched by it; and although I have partially described the form and nature of the building in which I use the said machine, yet such description is to be considered merely accidental, and not essential to the construction or operation of my said machine. I have now described my improved stretching machine, incorporating my said last improvements, and explained the mode of using the same; and I have hereinbefore stated that my said improvements may be distinguished and ascertained from my improved stretching machine, for which the former letters patent of the 14th April, 1831, were granted to me, by comparing these present with the instrument or specification enrolled by me pursuant to such last letters patent, subject to the declaration herein contained, limiting the extent of my claim.

"Now I do hereby declare, that I do not claim as part of my said improvements, the furnace flues, stove, and apparatus for drying, hereinbefore described, or any part thereof, or any of the adjuncts thereto. Nor do I claim any of the other several parts which, on such comparison of these presents with my former specification, will appear to have been by me added to or altered in my former improved stretching machine, in their individual or independent character, but only the arrangement and application thereof in the manner and for the purposes hereinbefore described, and as forming improvements on my former improved stretching machine; and so far only as the same are not comprised or included in my former improved stretching machine, or in my said former specification."—[*Inrolled in the Rolls Chapel Office, October,* 1834.]

ORIGINAL COMMUNICATION.

To the Editor of the London Journal of Arts, &c.

Sir,—The subject of paddle-wheels for steam-vessels having become very important and interesting to a large proportion of your readers, I request to be allowed to describe an improvement I have made in the arrangement of the boards or floats, by which many of the evils of the ordinary wheel are obviated; and this without the introduction of any mechanism or moving parts, the whole being fixed and solid, like the common wheel.

The principle may be thus illustrated:—Each board is divided into several parts, or narrower boards, and arranged in, or nearly, such cycloidal curves, that they all enter the water at the same place in immediate succession; thus avoiding the shock produced by the entrance of the common board, so unpleasant to passengers, injurious to the vessel, and wasteful of the power. As the acting face of each board is radiating, it propels while passing under the centre in the ordinary way, and when it emerges, the water escapes simultaneously from each narrow board, and, consequently, cannot lop-up.

The annexed drawings will fully explain the principle of the wheel, and its mode of operation.

No. 1, Plate X., is a drawing of a model exhibited to the Lords of the Admiralty in May, 1833.

No. 2, is a wheel which worked some time in a passage steamer in the River Thames, in 1833.

No. 3, is a diagram of a working model, with which many experiments were made in April and May, 1835, with an apparatus erected for the purpose of ascertaining the propelling power, and other properties, of various kinds of paddle-wheels.

I remain, Sir, your obedient servant,

JOSHUA FIELD.

Lambeth, November, 1835.

We have great pleasure in laying before our readers the foregoing communication from Mr. Field, the eminent engineer, particularly as the subject is a very important one; and also from having lately seen, at the Gallery of Practical Science, Lowther Arcade, a model of a paddle-wheel upon a precisely similar construction, called "Galloway's Patent Paddle-wheel." We do not know of any specification of Mr. Galloway's which describes this construction of wheel; but we suppose it to be the subject of a patent granted to Mr. Galloway, on the 18th August last, for certain improvements in paddle-wheels for propelling vessels, the specification of which will not be inrolled until the 18th February, 1836; we therefore shall not have an opportunity of reporting this specification until after that time, and, of course, cannot compare Mr. Field's wheel, above described, with the subject of Mr. Galloway's patent, but shall take the earliest opportunity of again referring to this subject.—EDITOR.

SCIENTIFIC ADJUDICATION.

VICE-CHANCELLOR'S COURT, SATURDAY, NOV. 7.

Mackintosh v. *Everington and Ellis.*

Mr. Knight moved for a special injunction exparte, to restrain the defendants from making and selling certain water-proof cloaks, &c., or otherwise invading the plaintiff's well-known patent. The plaintiff lately ascertained the existence of the fraud complained of, and sent a person to the defendant's shop to purchase some of the water-proof cloaks. The defendants produced some manufactured, as they said, by Fanshaw. When asked for Mackintosh's, the defendants replied that they had some, but they were in no demand, and that they could not recommend them. His Honour granted the injunction.

SCIENTIFIC NOTICES.

POLITICAL ECONOMY.—COMMISSION OF INQUIRY, INSTITUTED BY ORDER OF THE FRENCH GOVERNMENT, FOR THE REGULATION OF DUTIES UPON, OR PROHIBITIONS OF, FOREIGN MANUFACTURES.

Since the period of Napoleon's memorable Berlin and Milan decrees, in 1809-10, which, by their general interdiction, their confiscation and destruction, of British manufactures throughout the States under his iron sceptre, involved our commercial relations with the Continent in deep embarrassment, and affected our staple factories in their most important mercantile bearings—there has been, on the part of the several successive French administrations, an indisposition to extend the intercourse between the two countries upon terms of reciprocity—a constant jealousy of the results of a general admission to France of British staple articles of manufacture. The more liberal views upon the subject of foreign trade entertained by the British merchants and by our cabinet, have induced, since the general peace, many attempts to negotiate with the French administration, from time to time, a reduction of their tariff, or scale of customs, for the mutual benefit of the rival nations. These attempts have not been attended with much success; but they have paved the way to a commission of inquiry upon the subject of a reconstruction of the French tariff, which has elicited the views of some of the most able and opulent of the French manufacturers, as to the respective facilities of the two countries, in the production of several principal staple supplies, and as to the terms upon which British staple manufactures should be admitted into the French ports. The inquiry has excited the utmost interest in France; its importance, and its direct bearings upon the operations of our great manufacturing districts, render it an equal object of deep attention to our political economists, capitalists, and manufacturers. Impressed with this conviction, it is proposed to present to the readers of the "London Journal and Repertory of Arts, Sciences, and Manufactures," a condensed, but sufficiently ample, account of the entire examinations made by this commission. The following epitome of its labours has been expressly prepared for this Journal by a gentleman, who has himself been employed in negotiating with several successive administrations in France—a more extended line of policy in respect of the admission of British manufactures—a course which would eventually prove equally honourable and beneficial to the character and interests of both countries. The enlarged views of philanthropists must be engrafted upon the practical wisdom of statesmen, in order to effect the full and free interchange of the products of human industry amongst commercial nations; and to annihilate those indigenous jealousies which interfere with the reciprocal communication of the efforts of talent, industry, and enterprise.

A literal translation of the entire documents and examinations would prove too extensive for the limits of a periodical publication; but their order and substance are strictly adhered to, being principally drawn from the collection and arrangement made by MM. Cochan and De Moléon, as published in the "Recueil Industriel," No. 10 (Second Series), et seq.

"Memoirs and Extracts of the deliberations of the Chambers of Commerce, and the Consultative Boards of Arts and Manufactures, Acts of the Commission of Commercial Inquiry, and other documents, relative to the intended Law of Customs, to be submitted to the Legislative Chambers (the French Houses of Parliament) in their session of 1835."

It may be necessary to apprise English readers, that the "Chambers of Commerce," erected in the principal commercial cities of France, are entirely different in their constitution and attributes to those formed amongst us by voluntary association. The French "Chambers of Commerce" *form a part of the executive*—to them is intrusted the care of bankrupts' effects, until assignees are chosen; the fixing of their corporate seal upon bankrupts' property, upon that of insolvents, and of persons engaged in commerce who die intestate, until legal administrators are appointed. To these Chambers is intrusted the official inspection of the several staple articles of French manufacture, such as silks, cloths, &c., in the manufacturing districts, in order to preserve the general character of their respective qualities. The "Chambers of Commerce" are in constant communication with the "Administration of Commerce and of Public Works;" their members are elected by the body of merchants and manufacturers of the several districts, from the most intelligent and opulent of their class; and the elections are confirmed by the Government, which confides to their preliminary discussion all great measures relating to the fiscal department. The "Consultative Chambers, or Boards of Arts and Manufactures," are associations placed in communication with the "Chambers of Commerce," upon questions relative to the progress of the principal staples of France; and although these consultative chambers do not appear in the "Code Commercial" (part of the Cinq codes) to be invested with any official and public attributes, they are frequently joined in commissions of inquiry with the Chambers of Commerce.

These preliminary notices will give a clear idea of the construction of the commission, whose important labours form the subject of this paper. It may be necessary to observe, that the projected law for a complete change of the French customs, founded upon the report of this commission, has been partially discussed in the late session, and will be, in all probability, fully investigated in its principles during the ensuing session of the French Chambers. This information has been given us, as the general impression amongst commercial men at Paris, by a gentleman who has lately left that city.

The great importance of this commission may be gathered from the prefatory observations of MM. Cochan and De Moléon.

They observe, "that agricultural, manufacturing, and commercial France is altogether in a state of excitement; its fiscal system, under which the empire has so long subsisted, and whose tariff has hitherto served to direct the operations of commerce, of manufactures, and of agriculture, is upon the eve of being submitted to alterations, which cannot be effected with too much circumspection and wisdom. A commercial inquiry, *such as we have never seen,* subjected to the superior council of the Administration of Commerce, is prosecuted—not in silence, but publicly, and with the most open and solemn forms. Its proceedings are circulated by the press with rapidity to the extremities of the kingdom; the public seize them with daily avidity: one may truly say, that Frenchmen, forgetting their political dissensions and quarrels, occupy themselves solely with the customs. In order to second this ardent and general movement, we think it our duty to publish the memoirs and deliberations of the Chambers of Commerce, &c., and the examinations of the parties called upon the inquiry respecting the projected change of the fiscal law. We shall follow as much as possible the order of the questions discussed, and give such an analysis of the matter as shall contain whatever is most essential."

The "Recueil" then gives the history of the several "ordonnances" and projects of fiscal law since the year 1826. The free importation of thrown silk was permitted in 1833.

But the points which particularly affect BRITISH commerce and manufacture are comprised in the present examinations, relative to the *free* importation into France, or a prohibitive duty upon iron (bar, plate, and wrought), pit-coal, cattle, and, above all, the question of the free admission, or the prohibition, of our pottery,—of Birmingham, and other silver-plated goods, and of our cotton and cloth manufactures. Upon these most interesting subjects to our merchants and manufacturers, it is proposed to follow the order of the questions submitted to the Chambers of Commerce, &c. by the French Government.

There are in France two parties directly opposed to each other upon the question of the duties to be imposed by the new tariff upon foreign commerce. The Chambers of Commerce in the manufacturing districts and cities strongly urge upon the French government the necessity of continuing high duties upon most, and prohibitions of many, of the articles of foreign industry, as the only means of supporting the manufactures of

France in their several establishments. This system of "protecting duties," as they are termed, but rather of prohibitions, is attacked in all its bearings by several of the chambers of the commercial ports. The merchants of Bordeaux and of Havre have taken the lead in support of free trade, and they, with several other chambers, have declined assisting at the examinations directed by the government, on the ground that foreign productions should be subjected to duties, "not upon a *protecting* principle, but upon a purely *financial* principle, analogous to that which regulates their interior trade." "They declare solemnly that the general interests of the state can be alone consulted by the adoption of the principle of commercial liberty." The whole of this important question has, in the view of all parties, a direct bearing upon their future relative commercial situation in respect of *British* manufactures and trade; and, of course, our manufacturers and merchants are deeply interested in the result.

The examinations have resolved themselves into eight principal objects, or questions, as they are termed in the documents. Following the order in which they occur, we shall proceed to give the most important features of the evidence which more particularly bears upon our interests. The questions are arranged as follows:—1. upon iron, iron plates, and castings; 2. upon pit coal; 3. upon cattle; 4. upon saltpetre; 5. upon pottery; 6. upon glass; 7. upon plated goods; and 8. upon woollen and cotton cloths. Upon the first four questions, the diminution, or the retention of the prohibitive duties, forms the discussion; upon the latter four, whether or not the existing prohibition of import shall give place to a scale of moderate duties.

Having thus given a clear view of the bearings of the examinations, we will proceed to the facts elicited by the inquiry.

1. *Iron and Castings.*

In the year 1814, the import duty upon foreign iron was 15 francs per 100 kilograms, = 12*s.* 6*d.* upon 2 cwt. or 6*l.* 5*s.* the ton. In 1822, the import duty was raised to 25 francs, = 20*s.* 10*d.*, upon 2 cwt., or 10*l.* 8*s.* 4*d.* the ton, upon iron manufactured from pit coal, and upon rolled plate-iron. "This augmentation appeared necessary for the maintenance of our forges, which could not compete with the new kinds of iron introduced and sold cheaper than our manufacture, which was then produced by means of wood and the hammer." In 1829, M. de St. Criq, then Minister of Commerce, proposed te continue this augmented duty to the 1st January, 1835, then to reduce it one-tenth to 1838, and a second tenth to 1840. In 1833, the general councils of commerce, manufactures, and agriculture, discussed these duties without coming to any united proposition upon them. The Council of Manufactures proposed several modes of reduction, which were not adopted.

The report of the Commission of Inquiry, made by M. Meynard to the Chamber of Deputies, in April, 1834, is a document worthy the serious attention of English manufacturers. He says, "Because England is able to furnish us with cheaper iron, let us be upon our guard against inconsiderately placing ourselves under a foreign yoke; and by the uncertain allurement of a diminution of price, gratuitously compromising our existing establishments, the capitals sunk in them, and the workmen employed." "A diminution of the tariff to too great an extent would effect the progression of the national improvements. England manufactures annually 600 millions of kilograms of iron (equal to about 600,000 tons); this amount may be carried to double the extent with their actual working mines. Our production in every sort of iron, amounts to about 180 millions of kilograms (= 180,000 tons), and our consumption balances this production. Thus England could at this moment supply the whole of our wants for many years; and effect, by a competition which we are not in a state to sustain, the ruin of our metallurgic establishments.

"It is granted that foreigners can furnish us with this material at a cheaper rate; but if war should happen, our communications become interrupted, and our ports blockaded, from whence are we to provide ourselves? A false economy of a few millions would place us at the mercy of our rivals, without the means of defence, and our arsenals unprovided with iron.

"Seconded by experience, the English have gradually perfected their processes. This progressive development of their means of production has reduced their iron from 500 francs to 130 francs the ton. With them every thing favours the working of the metals;—minerals and fuel upon the same spot, numerous canals, immense capitals, perfected experience, certain protection, and legislation without fetters. These advantages are wanting to France. One hundred years were necessary to enable England to arrive at the perfection which her works have acquired: our associations and establishments have scarcely reached ten years—they are but just in a state of activity.

"At present, we manufacture in cast and other iron to the annual amount of 80 millions, = to 3,333,000*l.*

sterling, by means of about six hundred establishments scattered over sixty-three departments. The iron, smelted by pit coal, already forms one-eighth of the national production; an equal quantity is produced by wood founderies, and refinings by means of pit coal. Not more than three quarters of our smeltings are now effected by means of wood.

"Our iron from wood, only acknowledges that of Sweden for its superior: a permanent reduction in the general prices of 20 per cent. has been the result of the use of pure coal." The report goes on to state, "That upon these facts, a reduction of the duties which would tend to stop these trials (the use of coal in smelting) cannot be recommended,—it would suspend the realization of the riches which have too long remained unproductive in the bowels of our soil,—it would compromise the employment of more than 200 millions (francs) devoted to this branch of industry, and paralyze the capitals ready to be employed in it.

"Our production of iron increases, and the importation gradually decreases. In 1833, it was but 7 millions of kilograms, about 7000 tons. When the improvement of the hot-air blast shall be generally adopted, the expenses of manufacture will be considerably diminished. The smelting in Scotland, which under the old method cost 95 francs the ton, is now reduced by the new mode to 62 francs per ton."

The commission, in its report, offers some views connected with the French agricultural and other interests, upon which it bases the proposition of a reduction of 5 francs from the 25 franc duty upon 2 cwt., laid upon foreign iron coal smelted, and also upon rolled plate-iron, to take place from July, 1835. This proposition was not adopted by the Chamber of Deputies, and the duty remains as it was, awaiting the further discussion of this topic in the ensuing session.

Upon the proposed reduction of duty it is observed, that supposing English iron remains at 160 francs, about 6*l.* 12*s.*, the ton, and the import duty were to be reduced to 206 francs, about 8*l.* 12*s.*, the ton, the price of imported iron would be about the average price of French smeltings throughout the kingdom. It is observed, in a note that Lord Durham, in a public speech at Glasgow, estimated that it cost France annually 40 millions of francs, or upwards of 1,666,000*l.* sterling, in support of its founderies, by the exclusion of English iron under prohibitive duties. This is said to be an exaggeration of more than three-quarters. "It is acknowledged, that our iron costs us about double the price of English iron, should that be admitted duty free. Taking free imported English iron at 16 francs per 100 kilograms, and our home price at 32 francs, the difference upon our annual consumption, of 180 millions of kilograms, will not exceed 11 million francs; from which, deducting 3 million francs received by the treasury upon imported English iron, the difference is about 8 millions less than one-fourth of Lord Durham's calculation. Let us then submit to the momentary sacrifice which the future will refund, rather than, by free importation, annihilate a branch of industry necessary to the defence of the state, and the execution of all other works, and which employs 300,000 Frenchmen."

We have thus endeavoured to present to our readers the substance of this important question, and we propose treating the second subject of discussion in our following number.

HALLEY'S COMET.

The general attention which the return of this erratic visitor to our orbit has excited, renders some particular notice of its motions and appearances due to our scientific readers. The following is compressed from the pages of the *Foreign Quarterly Review* of Dr. Fisher's, and other works, as noticed in *The Mirror* of 25th of July, 1835:—

In August, 1835, the Comet had advanced towards the earth, from the distance of 230 millions of miles to within 130 millions. It rose about midnight during that month, and was visible till towards dawn in the eastern quarter of the heavens.

During the month of September, it advanced with augmented velocity towards the constellation of the Great Bear. In proportion as it approached nearer to us, its apparent magnitude increased considerably; towards the end of the month its generally calculated distance was 28 millions of miles. Dr. Fisher says only 27 millions; and that on the 6th of October its distance would be only about 16½ millions of miles,—being the nearest point of its approximation to our globe. Other astronomers have calculated the nearest point of its present revolution at 23 millions of miles. Its greatest brilliancy was at this period; but it has not been at any time very observable to the naked eye: and towards the middle of October it was still in the northern hemisphere, but at no great height above the horizon. From the period of the Comet's nearest point of approximation, it commenced its retrocession; and towards the end of the month it was low in the south-west, setting earlier every succeeding night. Its nearest point, therefore, as it occurred in October, has preceded the transit through the point of the perihelion, which did not occur until the beginning of last month, November —a circumstance that is to be regretted, because it is not till after their perihelion that comets assume their most brilliant appearance; and, in the present instance, that period will not coincide with the Comet's nearest point of proximity to our sphere.

It has been noticed that the Comet is now receding with a rapid motion from our earth; it approaches perceptibly nearer to the Sun, setting earlier every evening. On the 17th of November the Comet was, according to the calculations of Dr. Fisher, in its perihelion; consequently, it was no longer visible to us during the remainder of that month; nor will it be visible until towards the close of December, when it may be again seen by means of powerful telescopes, but at the immense distance of 190 millions of miles.

In the beginning of the month of January, 1836, this Comet will commence its re-progression towards the earth; it will issue from the Sun's rays, and again become visible, as it was at the end of August last. It will continue its approach to us during the month of February next, and remain visible.

On the 1st of March it will be about 120 millions of miles distant, and will be visible in the mornings, in the constellations of Corvus and Crater. From this time it will continue again to recede from the earth *and the Sun,* and will attain its greatest distance from the latter in the year 1873, and will again arrive at its perihelion in 1912.

It may be observed, that the French mathematicians differ considerably from Dr. Fisher in many points of their caculations. M. Pontécoulant fixes the 31st of

October as the day of the Comet's nearest transit through the point of the perihelion. M. Damoiseau calculates the 7th of November as the day.

Connected with the history of this Comet, Dr. Fisher has recorded some curious meteorological notices of circumstances which have attended its appearances. In the year 1005, a great famine accompanied its visit; in 1080, an earthquake; in 1155, its appearance was followed by a cold winter, and a general failure of the crops; in 1230, by destructive rains, and consequent inundations—a large portion of Friesland was overwhelmed, and 100,000 of its wretched inhabitants were destroyed by the floods. In the year 1304, this Comet was attended by a great drought in the summer months, and intense cold in the following winter, which was succeeded by a pestilence. The great famine in England in 1314, which was accompanied by one of the severest winters ever known here, followed by disease and pestilence to a most direful extent, can scarcely be attributed to the influences of the Comet, as these calamities occurred ten years after its previous visit to our regions. In 1380, the next appearance of this meteor, a destructive contagion depopulated Germany and other parts of the Continent. In 1456, wet weather, inundations, and earthquakes, marked its re-appearance. In 1607, again extreme drought, followed by a most severe winter. In 1682, floods and earthquakes; and in 1759, "*some* wet, and *slight* earthquakes," are recorded as the attendants of this portentous harbinger of calamity. From the latter portion of Dr. Fisher's historic summary, we may infer that the malignant influences of our *septuagintarial* visitor are on the decline, and hope that our globe may roll on to the ensuing vernal equinox without any more than its usual quantum of meteorological disaster.

NAPLES.

The variations in the temperature which have been observed in the course of this year, were at no time so sensible as in the month of October. On the 9th, the mercury in Réaumur's thermometer was at 21° 5 (=80° Fahrenheit); on the 16th it had fallen to 7° (= 47° 5. Fahrenheit). On the 18th it fell to 3° (= 38° 5. Fahrenheit). On this day, the summit of Mount Vesuvius was sprinkled with snow, and the mountains of Audia were completely covered. This is very extraordinary for our climate. The day before yesterday, the mercury had risen again to 16° 5. (= 68° Fahrenheit.)—*Giornale delle Due Sicilie, Oct.* 24.

PARIS—SEINE NAVIGATION COMPANY.

This Association is formed upon an invention of a rapid boat by MM. P. Faivret and Co., Paris, which they name " Nageur." These vessels will have a velocity equal to that of steam-boats, notwithstanding they are constructed without engine or boiler. They will offer to travellers a great saving of expense, and place them beyond the dangers of explosion. The principle of this invention is equally applicable to land carriages. The public may examine a model at the office of the Company. The shares are 1,000 francs each. The capital proposed to be raised—eight million francs.—*Ibid.* p. 141.

The above invention appears to pretend to some new motive power. The editor of the " Annales" promises an account of the first vessel when it has completed a voyage.—Ed.

List of Patents

Granted in Scotland from 12*th June to* 19*th September*, 1835.

To Richard Phillipps, of the New Kent-road, in the county of Surrey, lecturer at St. Thomas's Hospital, for an invention of certain improvements in the process of manufacturing sulphate of soda.—June 12.

To William Patterson, of Dublin, gentleman, for an invention of a new material for tanning hides and skins, which is also applicable to other purposes.—June 12.

To Alphonse Humberl Jean Francois Valois, of Lyons, in the kingdom of France, but now residing at No. 9, Artillery-place, Finsbury-square, in the parish of St. Luke, Old-street, and county of Middlesex, gentleman, for an invention of a certain improvement or certain improvements in the mode or method of producing engravings, etchings, or reliefs on metallic plates, and for producing impressions therefrom, and in the apparatus used in the same.—June 20.

To Elijah Galloway, of Westmoreland-place, in the county of Middlesex, engineer, for an invention of certain improvements in steam-engines, which improvements are applicable to other purposes.—June 26.

To John Losh, of No. 8, Crescent, in the city of Carlisle, gentleman, for an invention of an improvement in the surface or pattern roll of the machines used in printing calico and other goods, commonly called surface printing machines, and in the mode of working the said rolls.—June 26.

To William Kemp, of Burslaw, in the county of Stafford, teacher, for an invention of a machine or apparatus for raising sunken vessels.—July 3.

To Joshua Taylor Beale, of No. 11, Church-lane, Whitechapel, in the county of Middlesex, engineer, for an invention of a simplified and economical steam-engine, which engine may be used for other purposes.—July 4.

To John William Fraser, of Ludgate-hill, in the city of London, artist, for an invention of improvements in apparatus for descending under water, and for raising weights or bodies to the surface of the water.—July 6.

To Thomas Dunkin, of Bordeaux, in the kingdom of France, but now residing at No. 2, Trinity-place, Charing-cross, in the parish of St. Martin-in-the-Fields, and county of Middlesex, late officer in his Majesty's 18th regiment of Hussars, for an invention communicated to him by a certain foreigner residing abroad, for certain improvements in the mode, method, or system of obtaining or producing duplicate copies of manuscript writings and drawings, and in the apparatus or machinery used in the same.—July 6.

To Sir John Byerly, of Whitehead Grove, in the parish of St. Luke, Chelsea, in the county of Middlesex, knight, in consequence of a communication made to him by a foreigner residing abroad, for an invention of a composition which will effect a considerable saving in the oil and soap used in the woollen manufactures.—July 20.

To James Patterson, of Musselburgh, in the county of Edinburgh, net-manufacturer, for an invention of certain machinery for making herring-nets and other nets.—July 27.

To James Kean, of Johnston, in the county of Renfrew, in the kingdom of Scotland, machine-maker and engineer, for an invention of an improved throstle-flyer, or a substitute for an ordinary flyer employed in spinning cotton, flax, hemp, wool, silk, and other fibrous substances.—July 30.

To William Evat Wright, of Regent-street, in the city of Westminster, gentleman, for an invention of certain improvements in tea and coffee urns and tea kettles.—July 30.

To Samuel Burrell, of Birmingham, in the county of Warwick, manufacturer of gilt toys, for an invention of an improved method of manufacturing buttons for clothes.—August 7.

To Henry Bernard Chaussenol, of Leicester-square, in the county of Middlesex, for an invention of an improved construction of the lamps or apparatus used for burning gas, for producing a better combustion of the gas.—August 17.

To Richard Coad, of Liverpool, in the county of Lancaster, manufacturing chemist, for an invention of certain improvements in the means of, or apparatus for consuming smoke and economising fuel or furnaces.—August 22.

To Rowland Hill, of Tottenham, in the county of Middlesex, for an invention of certain improvements in certain methods of letter-press printing by machinery.—August 24.

To Frederick Bowman, of Great Alie-street, in the county of Middlesex, sugar-refiner, in consequence of a communication from a certain foreigner residing abroad, for an invention of an improvement in the process of renewing the virtues of animal charcoal when exhausted or impaired.—August 28.

To Thomas Hancock, of Goswell-mews, Goswell-street-road, in the county of Middlesex, water-proof cloth manufacturer, for an invention of an improvement or improvements in air beds, cushions, and other articles manufactured from caoutchouc or Indian rubber, or of cloth, or other flexible material coated or lined with caoutchouc or Indian rubber.—August 28.

To William Hale, of Colchester, in the county of Essex, civil-engineer, for an invention of certain improvements on, or additions to, boilers or apparatus for producing motive power.—September 16.

To John Dickenson, of Bedford-row, London, paper manufacturer, and William Long Tyers, of Apsley-mill, in the parish of King's Langley, in the county of Hertford, paper-maker, for an invention of certain improvements in the manufacture of paper.—September 16.

To William Symington, of Bromley, in the county of Middlesex, cooper, for an invention of certain improvements in paddle-wheels.—September 19.

To Andrew Baldreau, chenille-cutter, residing in Paisley, for an invention of a machine for cutting chenille cloth into chenille thread, for making weft, or part of weft, for the shawls now called and known by the name of chenille, Kamtschatka moss, and Velour's de soi, or one or other of these names.—September 19.

New Patents

SEALED IN ENGLAND, 1835.

To John Birkley, of High Town, near Leeds, card-maker, for his invention of improvements in machinery for pointing wire applicable for making of cards and pins.—Sealed 29th October—6 months for inrolment.

To John Springall, of Sutton, in the county of Suffolk, iron-founder, and Robert Ransom, of Ipswich, in the same county, for their invention of an improved mode of manufacturing certain parts of ploughs.—Sealed 2d November—6 months for inrolment.

To William Keene, of Bankside, in the county of Surrey, engineer, for certain improvements in machinery or apparatus for sowing corn, grain, and other seed, and manuring land, being a communication from a foreigner residing abroad.—Sealed 2d November—6 months for inrolment.

To John Chanter, of Earl-street, in the city of London, and of Upper Stamford-street, in the county of Surrey, Esq., and John Gray, of Liverpool, in the county of Lancaster, engineer, for their invention of a new combination of parts forming an improved furnace for consuming smoke, and economizing fuel applicable to locomotive carriages, steam boats, and other useful purposes.—Sealed 2d November—6 months for inrolment.

To William Crofts, of Radford, in the county of Nottingham, machine-maker, for his invention of certain improvements in machinery for making bobbin-net lace, part of which improvements are for the purpose of making figured or ornamented bobbin-net lace.—Sealed 4th November—6 months for inrolment.

To John Whitehead, of Hereford-cottage, Old Brompton, in the county of Middlesex, chemist, for his invention of certain improvements in scouring and cleansing.—Sealed 5th November—6 months for inrolment.

To Thomas, Earl of Dundonald, of Regent's-park, in the county of Middlesex, for his invention of improvements in machinery, and apparatus applicable to purposes of locomotion.—Sealed 5th November—6 months for inrolment.

To Henry Adcock, of Summer-hill Terrace, Birmingham, engineer, for his invention of certain improvements in docks and quays, to facilitate the importation and exportation of merchandise, and abridge labour.—Sealed 5th November—6 months for inrolment.

To William Symington, of Bromley, in the county of Middlesex, cooper, for his invention of certain improvements in the machinery for propelling vessels by steam, parts of which are also applicable to motive machinery of other descriptions, whether actuated by steam or by any other moving power.—Sealed 7th November—6 months for inrolment.

To John Wilde, late of New York, in the United States of North America, but now residing in Manchester, in the county palatine of Lancaster, merchant, and Joseph Whitworth, of the latter place, engineer, for certain machinery for effecting the operation called knitting, and producing a fabric similar to that of knitted stockings, being partly a communication from a foreigner residing abroad.—Sealed 10th November—6 months for inrolment.

To Thomas Greig, of Rose Bank, in the parish of Bury, in the county of Lancaster, calico-printer, for his invention of a mode of embossing and printing, at one and the same time, by means of a cylinder or roller on goods or fabrics made of or from cotton, silk, flax, hemp, and wool, or any one or more of these materials, or on paper.—Sealed 10th November—6 months for inrolment.

To John Ericsson, of Albany-street, Regent's-park, in the county of Middlesex, civil engineer, for his invention of an instrument for ascertaining the depth of water in seas and rivers.—Sealed 14th November—6 months for inrolment.

To John William Fraser, of Ludgate-hill, in the city of London, artist, for his invention of certain improvements in apparatus for descending under water.—Sealed 14th November—6 months for inrolment.

To Nicholas Troughton, of Broad-street, in the city of London, gentleman, for an improvement in finishing ornamental walls, and other ornamental surfaces, being a communication from a foreigner residing abroad.—Sealed 14th November—6 months for inrolment.

To James Cropper, of the town and county of the town of Nottingham, lace-manufacturer, and Thomas Brown Milnes, of Lenton Works, in the county of Nottingham, bleacher, for certain improvements in machinery, or apparatus for embroidering or ornamenting bobbin-net or lace, or cloths, stuff, or other fabrics made from silk, cotton, wool, flax, or hemp, being a communication from a foreigner residing abroad.—Sealed 14th November—6 months for inrolment.

To John Joseph Charles Sheridan, of Walworth, in the county of Surrey, chemist, for his invention of certain improvements in the several processes of saccharine, vinous, and acetous fermentation.—Sealed 17th November—6 months for inrolment.

CELESTIAL PHENOMENA, FOR DECEMBER, 1835.

D.	H.	M.	
1			Clock after the ☉ 10 m. 54 s.
	—		☽ rises 2 h. 32 m. A.
	—		☽ passes the mer. 9 h. 26 m. A.
	—		☽ sets 3 h. 26 m. M.
2	17	55	♃'s fourth sat. will im.
4			Occul. γ Tauri, im. 12h. 19m., em. 13h. 33m.
	4		☽ in Apogee.
	14	40	♃'s first sat. will im.
	16	30	♃'s second sat. will im.
5			Clock after the ☉ 9m. 20s.
	—		☽ rises 3 h. 53 m. A.
	—		☽ passes the mer. M.
	—		☽ sets 8h. 6m. M.
	5	36	Ecliptic oppo. or ○ full moon.
6	9	9	♃'s first sat. will im.
7	6	37	♃ in the ascending node.
	8	40	♃ in conj. with the ☽ diff. of dec. 3. 43.
10			Clock after the ☉ 7 m. 10 s.
	—		☽ rises 8h. 39 m. A.
	—		☽ passes the mer. 3h. 50m. M.
	—		☽ sets 11h. 58m. M.
	—		Occul. η Leonis, im. 18h. 27m., em. 19h. 4m.
11	16	34	♃'s first sat. will im.
12			γ Virginis a near approach.
13	4	16	☽ in □ or last quarter.
	11	2	♃'s first sat. will im.
15			Clock after the ☉ 4m. 59s.
	—		☽ rises 1h. 52m. M.
	—		☽ passes the mer. 7h. 45 m. M.
	—		☽ sets 1 h. 22 m. A.
	8	26	♃'s second sat. will im.
	17	9	♄ in conj. with the ☽ diff. of dec. 0. 2.
16		3	☿ in the descending node.
17	9	15	♃'s third sat. will im.
	14	8	♀ in Aphelion.
18			Mer. R. A. 16 h. 56 m. dec. 22. 53. S.
	—		Ven. R. A. 19 h. 3 m. dec. 23. 56. S.
	—		Mars R. A. 17 h. 44 m. dec. 24. 6. S.
	—		Vesta R. A. 11 h. 55 m. dec. 6. 58. N.
	—		Juno R. A. 6 h. 50 m. dec. 0. 8. S.
18			Pallas R. A. 18 h. 44 m. dec. 2. 17. N.
	—		Ceres R. A. 19 h. 24 m. dec. 26. 53. S.
	—		Jup. R. A. 6 h. 56 m. dec. 22 52. N.
	—		Sat. R. A. 14 h. 5 m. dec. 10. 11. S.
	—		Georg. R. A. 21 h. 59 m. dec. 13. 5. S.
	—		☿ passes the mer. 22h. 13 m.
	—		♀ passes the mer. 1 h. 17 m.
	—		♂ passes the mer. 23h. 58m.
	—		♃ passes the mer. 13h. 7m.
	16	8	☿ in conj. with the ☽ diff. of dec. 1. 16.
	18		☽ in Perigee.
	18	28	♃'s first sat. will im.
19	9	14	Ecliptic conj. or ● new moon.
	9	29	♂ in conj. with the ☽ diff. of dec. 1. 48.
	11	53	♃'s fourth sat. will im.
	14		♃'s fourth sat. will em.
	19	10	♂ in conj. with the ☉
20			Clock after the ☉ 2m. 21s.
	—		☽ rises 9 h. 8 m. M.
	—		☽ passes the mer. 0 h. 38 m. A.
	—		☽ sets 4 h. 8 m. A.
	12	56	♃'s first sat. will im.
	17	7	♀ in conj. with the ☽ diff. of dec. 2. 36.
22	0	19	☉ enters Capri., Winter commences.
	7	25	♃'s first sat. will im.
	11	3	♃'s second sat. will im.
23	9	19	♅ in conj. with the ☽ diff. of dec. 4. 46.
24	13	14	♃'s third sat. will im.
26	3	26	☿ in Aphelion.
	7	34	☽ in □ or first quarter.
27	14	50	♃'s first sat. will im.
29	9	19	♃'s first sat. will im.
	13	40	♃'s second sat. will im.
30	11		☽ in Apogee.
	16	3	☿ in conj. with ♂ diff. of dec. 0. 45.
	17	14	♃'s third sat. will im.

J. LEWTHWAITE, Rotherhithe.

METEOROLOGICAL JOURNAL,

FOR OCTOBER AND NOVEMBER, 1835.

1835.	Thermo.		Barometer.		Rain in inches.	1835.	Thermo.		Barometer.		Rain in inches.
	Hig.	Low.	High.	Low.			Hig.	Low.	High.	Low.	
Oct.						Nov.					
26	52	42	29,39	29,23	,725	10	40	32	30,30	30,22	
27	49	36	29,78	29,62	,025	11	44	31	30,31	30,24	
28	48	30	29,95	29,88		12	45	33	30,18	30,14	,025
29	55	39	29,98	29,84	,25	13	43	33	30,27	30,25	,05
30	47	28	30,12	30,08	,025	14	44	33	30,13	30,01	
31	57	44	29,95	29,83	,65	15	46	37	30,04	30,01	,025
Nov.						16	45	33	29,97	29,91	
1	46	36	30,14	30,07	,05	17	48	33	29,87	29,83	
2	47	28	30,15	30,09		18	54	40	29,78	29,65	
3	48	42	29,99	29,91	,25	19	49	53	29,95	29,87	,075
4	43	38	30,01	29,97		20	51	32	29,95	29,90	
5	43	34	29,93	29,87	,05	21	55	46	29,85	29,84	
6	43	26	29,89	29,84		22	55	47	29,79	29,73	,025
7	47	26	29,98	29,91	,025	23	54	48	29,83	29,73	,175
8	48	37	29,94	29,85	,25	24	54	38	29,81	29,79	
9	41	36	30,14	30,00		25	55	45	29,78	29,72	

Northern Lights.—From the Aurora Borealis on the evening of the 18th of November, we had a more intense light than I ever before remember to have seen, extending from the western point of the horizon to the N.N.E. The bank of cloud from which the light proceeded was of a curved form, rising to the highest about due north. From eight till near midnight the light was at its maximum; during the whole time I observed no coruscation.

Spots on the Sun.—The numerous and large spots at present on the solar disc, are well worthy of attention. Query—Has the disturbed state of the solar atmosphere during the past few days any connexion with the perihelion passage of Halley's Comet? which I have not seen since the 15th of November.

Edmonton.

CHARLES HENRY ADAMS.

Latitude 51° 37 32 N.
Longitude 3 51 West of Greenwich.

THE

London

JOURNAL AND REPERTORY

OF

Arts, Sciences, and Manufactures.

CONJOINED SERIES.

No. XLVI.

Recent Patents.

To Benjamin Hick, *of Bolton-le-Moors, in the county palatine of Lancaster, engineer, for his invention of certain improvements in locomotive steam-carriages, parts of which improvements are applicable to ordinary carriages, and to steam-engines employed for other uses.*—[Sealed 8th October, 1834.]

This invention consists in the peculiar arrangement of the steam cylinders, and in the manner of applying the power to the running wheels, also in the construction of the running wheels. The drawings hereunto annexed represent a locomotive engine fitted with the improvements adapted to railroads, which are represented in the several figures of Plate XI.

Fig. 1, is a side elevation of the engine and carriage; fig. 2, is a plan or bird's-eye view of the same; fig. 3, is a longitudinal section partly in elevation; fig. 4, is a plan partly in section; fig. 5, is an end view partly in section; fig. 6, is a cross section of the engine through the centre of the running wheels, showing one mode of constructing those wheels; fig. 7, is a section of the wheels, constructed upon another mode, and represented on a larger scale. The same letters refer to similar parts in each figure: *a*, is the boiler, containing numerous pipes or tubes *b*, placed vertically, and surrounded by water. The lower ends of these tubes open into the top of the furnace or fire-box *c*, which is supplied with fuel through the aperture *d*, covered with the door *e*. The sides, ends, and top of the fire-box are separated from the exterior shell of the boiler by a space filled with water: *f*, represents the grate bars; *g*, is an inverted frustrum of a cone or dome opening into the top of the fire-box, and rising thence to within a small space of the level of the water, for the purpose of exposing a large surface to the direct radiant action of the fire, and in order to prevent the heated gases and smoke from passing too rapidly off through the tubes. It serves also to diminish the weight of the water in the boiler.

The chamber *h*, receives the steam generated in the boiler; which steam chamber is surrounded by the heated matter which escapes from the upper parts of the tubes, and ascends to the chimney through the space between the exterior cover of the boiler and the chamber. The pipe *i*, conducts the steam from the boiler to the valve-boxes *j*, whence it is transmitted in succession at proper intervals by the valves *k*, to the upper parts of the three cylinders *l*. The steam is withdrawn from the cylinders after each stroke of the pistons *m*, by the eduction pipes *n*, which discharges it in the usual way into the chimney. The cylinders are closed at the top, but are open to the atmosphere at the bottom, so that the steam presses only on the upper surface of each piston. Each of the connecting rods *o*, is coupled to the under surface of its piston by a joint, and the pistons are kept steady in their proper positions by the small rods *p*, attached to them, which work freely through the guiders *q*. The three connecting rods act upon the cranked axle *r*, upon which toothed wheels *s*, *t*, of different diameters, are keyed, the crank pins *u*, fixed in the wheels, and the crank *v*, being respectively placed at an angle of one hundred and twenty degrees with each other, by which means a very uniform rotary motion will be communicated to the axle or shaft *r*. These toothed wheels work into and drive two other wheels *w*, *x*, fitted so as to turn freely upon the shaft *y*, on the ends of which two of the running wheels of the carriage are keyed fast. A clutch-box *z*, slides laterally upon keys bedded into the shaft *y*, which keys prevent the clutch box from revolving without the shaft. The lateral sliding movement may be given to the clutch-box by a forked lever, or by any other convenient method.

When it is required to impel the carriage with the greatest velocity, as on a level line of railway, the clutch-box is to be brought into gear with the equal wheels *s*, *w*, whereas, when greater power is desired with a diminished speed, as on an ascending road, the clutch-box is to be disengaged from the equal wheels, and thrown into gear with the unequal pair *t* *x*, on the opposite side.

In the figures the small wheel *t*, is represented to be only one half the diameter of the larger wheel *x*, which dimensions would cause the carriage to be impelled by those wheels with one half the velocity, but with double the power of that derived from the action of the equal wheels. The ratio of the unequal pair of wheels may be varied according to circumstances, so as to produce greater or less relative velocity and power.

In descending inclined planes or roads the clutch-box may be altogether disengaged from the wheels, when it will be in the position represented in fig. 4, and the carriage will descend the road by its own gravity, the engines and toothed wheels remaining in a state of rest. It is also evident, that with the clutch-box in this last position the engine may be worked whilst the carriage itself is stationary.

It is unnecessary to describe in detail the framework of the engine carriage, as it is well known that each particular engine requires a carriage arranged expressly to receive it; nor is it needful to explain in language the manner of working the valves. The valve mechanism is sufficiently shown in the different figures, and I lay no claim to any peculiar form of valve, or mode of working it. The foregoing description refers specially to the locomotive engine represented in the drawings, the several parts of which I consider to be disposed in the most advantageous manner, but I do not mean to claim the whole as my invention.

I claim as my invention the combination of two or more cylinders, each having its lower end open, so that the steam presses only upon the upper surfaces of the pistons, and communicates its power to the crank shaft or running wheels in a downward direction only. I apprehend that by these means greater adhesion will be obtained between the wheels and the road, and that less vibration will be given to the carriage than when the power is applied to the wheels in an upward and downward, or in a forward and backward, direction alternately. I do not mean to prescribe the use of three rather than two, or any other convenient number of steam cylinders exceeding one, though for locomotive purposes and general use three cylinders will be most suitable. The power of the engine may, if preferred, be directly communicated through the connecting rods to a cranked axle placed beneath the cylinders, and on which the running wheels are fixed, instead of being applied through the medium of toothed wheels. It is also obvious that this arrangement of cylinders is equally applicable to steam-engines employed for other purposes than locomotion.

I will now proceed to describe the improvements in carriage-wheels which I claim as my invention, two modes of constructing which are represented in section in figs. 6, and 7: A, is the nave of cast-iron, or other metal; B, the rim or felly of rolled iron; C, discs of plate iron, which unite the nave with the rim or felly. Fig. 7, shows one method of making these wheels. The exterior faces of the flaunches D, are cast to the required form, the interior parts E, of the felly being turned to receive the discs. The discs are brought to fit the nave and felly accurately and tightly, by being pressed to the exact shape and size in a block of metal.

The discs may also, if the wheels are destined to carry great weights, be tightly pressed into the recesses of the nave and felly, or the fellies may be expanded by heat, and then allowed to contract upon the discs by cooling, as in the usual way. The discs are secured in their places by four or more bolts or rivets F, according to the size of the wheels passing through the flaunches of the nave, and by a few bolts or rivets, which prevent them from separating from the felly. Fig. 6, shows another method of fitting up this kind of wheel, by which it will be seen that the nave A, has only one flaunch D, cast upon it, its outer side being turned parallel to receive the separate flaunch G, which is accurately bored to fit it, to which flaunch one of the discs is rivetted or bolted. This separate flaunch, with its disc, being placed upon the nave, is screwed up by the tightening bolts H, passing through it and the flaunch D, until the peripheries of the discs are in close contact with the interior surface of the felly turned to receive them. The separate flaunch and disc may also be tightly pressed into their place, and then made fast by bolts or rivets, as before explained. A small key or pin is introduced, to secure the separate flaunch and disc on the nave.

It will be seen that the wheels in the several figures are formed with fellies or tires suitable to railways, but I do not confine myself to this adaptation. Wheels for carts, waggons, coaches, timber carriages, and for many other uses, may be advantageously constructed on this principle. The forms, dimensions, nature, and strength of material of the naves, discs, and fellies, as well as the mode of uniting the different parts, may be varied, in order to suit the particular purpose for which the wheels are required, and to the wear and tear to which they are liable. For wheels of very large diameters, discs of iron in entire plates could not be procured, in which case I intend to compose the disc by rivetting together several plates cut to segments of the required diameter. And I do hereby declare this to be my specification of my said invention, and do verily believe that the same doth comply in all respects with the said proviso in the hereinbefore in part recited letters patent contained.—[*Inrolled in the Rolls Chapel Office, April,* 1835.]

Specification drawn by the Patentee.

To Joseph Barker, *of Southampton-street, Camberwell, in the county of Surrey, gentleman, for his invention of an improvement in the construction of umbrellas and parasols.*—[Sealed 25th March, 1835.]

The first object of this improvement in umbrellas and parasols, is to construct them without stretchers in the inside, in order that they may afford better shelter than umbrellas or parasols of the ordinary kind; and, secondly, a mode of rendering them capable of opening and shutting with greater ease and expedition than parasols of the ordinary construction, the removal of the stretchers enabling them to be brought closer to the head, and preventing the inconvenience of striking against the hat or bonnet of the persons using them. This invention also consists in opening and shutting the umbrella or parasol, either by a screw, a combination of screw and slide, or a rack and pinion placed in or near the handle of the umbrella or parasol, and acting upon or working a rod or tube passing from the screw, screw and slide, or rack and pinion, up the inside of the cane or tube forming the stem of the umbrella or parasol, to the top thereof, and there connected to a cap, to which the suspenders are fastened; by which means the umbrella or parasol may be opened and shut with ease and expedition, and, when shut, the ribs be prevented from falling open by the cap to which the suspenders are fastened, being made to close upon shoulders formed on the metal tips inserted in the top notch, and, if thought necessary, be securely retained close to the stem of the umbrella or parasol, by the addition of a cup to come over the cap and the ends of the suspenders.

Plate XII., fig. 1, is a section taken through the stem and handle of an umbrella, showing sufficient parts to explain the improvements, the ribs being extended, or in the situation they would assume when the umbrella is opened.

Fig. 2, is another similar section, showing the ribs collapsed and secured in this position by the cap and cup, to prevent their falling open, the spring catch of ordinary umbrellas not being applicable to this construction: *a, a,* are the ribs or whalebone stretchers; *b, b,* the suspenders; *c,* the hook of the handle; *d, d,* the hollow stem. The ribs or stretchers *a, a,* are secured to the wheel or top notch *e,* by a wire passed through holes in the tips or mountings *f, f,* on the ends of the ribs, as in ordinary umbrellas, the top notch being obliquely rivetted, or otherwise securely fastened to the stem *d,* in such a manner, that the rivets, where rivets are used, do not interfere with the rod passing up the hollow stem.

The suspenders *b,* are connected at one end to the ribs *a,* and at the other (which may be plain or forked) to the cap *g, g,* by wires passed through holes on their forked or upper ends. The cap *g,* is braised or soldered on the tube *h,* which slides freely upon the upper part of the stem, and carries the cup *i,* hereinafter described, which is capable of sliding a short distance upon the tube *h.*

The cup *i,* is connected by a strong pin or rivet *j,* to the internal rod *k*, there being two long slots *l*, formed in the top part of the stem, and two short slots in the tube *h*, to allow of the pin or rivet *j*, moving up and down, as the umbrella is opened and closed.

The lower end of the rod *k*, is securely connected by rivets, or otherwise, to the tube *m, m*, which has the female screw *n, n*, securely fastened into it, as also the two guides *o, o*, (see the two detached sections, figs. 3, and 4,) which guides move in grooves *p, p*, formed in the lower or handle part of the stem of the umbrella or parasol: *q*, is a collar or clutch stop piece, (shown detached in perspective at fig. 5,) which piece is securely fastened by rivets, or otherwise, to the end of the stem of the umbrella: *r*, is the shaft, and *s*, the thread or worm of the male screw; which shaft is firmly fastened by a rivet, or otherwise, into the hook *c*. The shaft *r*, also carries the other clutch stop piece *t*, fastened to it by a rivet, or otherwise (see the detached view of the shaft at fig. 6).

The use of these clutch pieces is to prevent the reaction of the screw when in the act of opening the umbrella until it is fully expanded, when it is retained open by a notch *u*, formed in the thread of the female screw, which lets the shoulder formed by the notch fall into a corresponding notch *v*, in the worm or thread of the male screw *s*, as shown in fig. 1. The piece *q*, by being fastened in the stem, sustains the downward pressure of the umbrella caused by the tension of its covering; and the shoulder *w*, of the screw shaft *r*, working against its bottom part, prevents the male screw from being drawn into the stem further than necessary, to allow the clutch pieces *q*, and *t*, to pass each other when the male screw is turned round.

Having now mentioned the various parts, I will proceed to describe their action in opening or closing the umbrella. Supposing the umbrella to be closed, the inclined insides of the cap *g*, will have closed over the inclined ends of the tips *f*, *f*, as at fig. 2, whereby the ribs are prevented from falling open, and this is more securely effected by the cup *i*, which is brought down over the cap *g*, and the ends of suspenders *b*, and holds them in that position.

When it is wished to open or expand the umbrella, the hook or handle *c*, is to be turned round towards the right hand, which will cause the shaft *r*, and male screw *s*, and the clutch piece *t*, to be turned also, by which the male screw will act upon the female screw *n*, and force it upward, carrying with it the internal rod *k*, the screw *n*, being prevented from turning round by the guide pieces *o*, and grooves *p*.

The rod *k*, as it rises, will first carry with it the cup *i*, and as soon as it has risen from off the ends of the suspenders into the position shown by dots in fig. 2, the rivet or pin will have moved up the short slot in the tube *h*, and the ribs will then be at liberty to expand, which will be effected by the continued rising of the rod *k*, carrying with it the cup *i*, the tube *h*, and cap *g*, which will draw up the suspenders, and cause them to expand the ribs into the position shown in fig. 1; and as soon as the notch *u*, of the screw *n*, comes into contact with the notch *v*, of the screw *s*, the umbrella will be sufficiently expanded, the notch preventing the return of the female screw *n*, or its carrying round the male screw *t*, and, consequently, keeping the umbrella expanded.

When it is wished to shut the umbrella, the handle is to be turned the reverse way; this will cause the male screw to disunite the notches *u*, and *v*, and the female screw will easily follow the motion of the male screw, from its having the force of the umbrella and extended silk, or other covering, upon it: the notches on the clutch pieces *q*, and *t*, passing each other as the male screw is turned round. The continuous motion of the male screw draws down the cap *g*, and cup *i*, into the position shown in fig. 2.

Figs. 7, and 8, are partial sections of the top part of an umbrella, showing a variation of the method of inventing the cap *g*, and cup *i*. Fig. 7, shows the parts in the position they are in when the umbrella or parasol is closed; and fig. 8, the same expanded. In this instance, the stem of the umbrella terminates at the upper side of the top notch *e*; and the cap *g*, and tube *h*, are mounted, sliding upon the internal rod *k*, instead of the stem of the umbrella, as in the former instance; and the cup *i*, is fixed upon a piece of cane or tube uniform with the stem, which is fastened by a rivet on the internal rod *k*, a short distance above the cap *g*.

When the umbrella is closed, the parts are in the position shown in fig. 7, but on turning the male screw and raising the internal rod *k*, the cup *i*, will first be raised with the top part of the stem; and as soon as the cup is clear of the ribs and suspenders, the bottom of the short slot in the rod *k*, will have come in contact with the rivet *j*, and then the cap *g*, will be raised, and extend the ribs as before. On turning the hook the reverse way, the collapsing action takes place as before.

Fig. 9, is a partial outside view of the top part of an umbrella or parasol, in which another variation of the construction is shown. In this instance the suspenders are connected to a sliding ring *x*, on the outside of the cup *i*, instead of being jointed to the cap *g*, as in the former instance, the cup *i*, closing over the ends of the ribs when the umbrella or parasol is down; but on raising the rod *k*, the cup rises, when it releases the ribs, and as it continues to rise the ribs are extended, as in fig. 9, the rim or ledge on the hollow part of the cup *i*, retaining the ring *x*; and on drawing down the rod *k*, the reverse motion takes place.

Fig. 10, shows a method of obtaining the required motion for raising and lowering the rod *k*, by a combination of a sliding motion with the screw motion; and in this instance the internal rod *k*, carries one of the screws *n*, and the other, *s*, is connected to the top of its shaft *r*, which is fixed into the handle as before. This figure shows the position of the parts when the umbrella is open: *d*, is the stem of the umbrella, with a tube fixed on its lower end; and *y*, is a tube forming part of the handle, which tube may be covered in any manner according to the taste of the manufacturer: *q*, is the stop or abutment piece for the screws, which in this instance do not require any clutch notches: *z*, is a sort of bayonet-fastening, formed by a projecting stud or pin on the tube at the end of the stem *d*, working in a groove formed in the tube *y*. When it is required to expand the umbrella, the stem is to be held in one hand, and the tube *y*, turned a little towards the left, so as to clear the stud from the notch at the top end of the slot *z*; then the tube *y*, or handle, is to be pushed upwards, which will carry off the cup *i*, and partly expand the umbrella, and bring the stud to the bottom of the slot *z*. The hook of the handle is to be turned round towards the right hand, when the screws will come into action, and complete the expansion of the umbrella, till the notches *u*, and *v*, come into contact with each other, as shown in the figure. At this time the stud will be in the notch at the lower end of the slot *z*. The screw *n*, is prevented from turning by guides working in slots formed in the tube *y*.

For the information of the workman, the Patentee observes, that the object of making the suspenders forked at the end inserted in the cap, is to steady the ribs. The suspenders may be of any length, varying from two to six inches for parasols, and from six to eleven for umbrellas. When very short suspenders are used, the ribs should be reduced in substance a little on the upper side, about one-third from the lower end.

When a cup is used, it will be more convenient to make the umbrella domed or témple-topped, like ordinary parasols. When no cup is used, the cover may be the same as in common umbrellas, and be covered at the top by a bell-mouthed ferrule, or swage, either fastened by oblique rivets or screw in the tube *h*.

In putting the umbrella together it is only necessary to observe, that as the clutch piece *q*, traverses freely on the shaft *r*, between the clutch piece *t*, and the shoulder *w*, the rivets necessary to fix the clutch piece *q*, into the stem should be inserted previously to putting in the hook *c*. Where the clutch piece *q*, is not of sufficient substance to allow of rivet holes being drilled in its sides, notches cut on each side deep enough for the rivet to lie in will be sufficient. The screw may be formed of either brass, iron, or steel, or any other durable metal. The clutch pieces had better be of either iron or steel, or they will be apt to wear out.

Where ivory handles are used, it is very convenient to have the end next the hook *c*, formed with a cap to screw on, which cap effectually conceals the ends of the grooves formed in the handle for the guides to move in. This cap is put on before the hook *c*. The internal rod may be made either of small cane or of wood, or consist of a small tube.

In order that these improvements may be better understood, and be of greater public utility, several different methods of constructing the various parts used in effecting the object of the improvement have been shown and described; but the Patentee does not confine himself to the precise form or arrangement of the parts shown, as they may be varied to suit different shapes, or the will or taste of the manufacturer. And it is also to be understood, that he does not mean to claim the placing of the stretchers or suspenders outside or above the ribs, or the mode of inserting them in the ribs, or any other part of the construction of the umbrella or parasol, which may be old, or can fairly be considered as common to an ordinary umbrella or parasol, and not peculiar to his improvement.—[*Inrolled in the Rolls Chapel Office, September*, 1835.]

To JOHN COWDEROY, *of Britannia-street, Hoxton New-road, in the county of Middlesex, gentleman, for his invention of certain improvements in machinery or apparatus to be used in the process of making or manufacturing bread and biscuits.*—[Sealed 14th October, 1831.]

THIS invention consists in making bread upon an extensive scale almost exclusively by machinery, the object of which, as expressed by the Patentee, is, that it may be "free from the impurities which must necessarily be introduced into the dough when made by hand."

The specification exhibits the whole process, from mixing the flour with the water, or compound of water, yeast, and perhaps other ingredients, called by the Patentee the "ferment," of kneading it into dough, of pressing and dividing the dough into suitable portions to make loaves of bread, and of carrying the said divided dough collectively into an oven to be baked: all of which operations are to be effected by a consecutive series of machinery erected in an extensive bakehouse.

The mode of preparing the sponge will be understood by reference to fig. 11, Plate XII., which represents in longitudinal section the apparatus to be employed for this part of the operation: *a*, is a tub or vat containing the "ferment" or liquid ingredients to be mixed with the flour to make the dough. The supply of this liquor is regulated by a stop-cock *b*. A box or receptacle *c*, containing the flour, has a wire-gauze bottom, as a sieve, for the purpose of distributing the flour evenly over the surface of an inclined plane *d*.

To aid the equal delivery and distribution of the flour upon the inclined plane *d*, that is, cause it to fall more readily through the wire gauze, a cylindrical brush *e*, is mounted on an axle at the bottom of the flour-box, and is made to revolve by a band and pulley, for the purpose of clearing the interstices of the wire gauze or sieve at the bottom, and thereby discharging the flour more readily. The flour thus delivered on to the inclined plane becomes mixed with the ferment or liquid ingredients, flowing down the inclined plane by the action of the kneading apparatus *f*, which is made to slide laterally to and fro upon the rails *g*, *g*, by means of a crank and rod connected to a bar *h*, into which the kneading rails are fixed.

As the process of kneading goes on, the dough slides down the inclined plane, and falls into a bin *i*, where it is further operated upon by a similar kneading apparatus, the parts of which so closely resemble that operating upon the inclined plane as to need no further explanation. It may be observed, that the inclined plane is mounted upon a hinge, for the purpose of placing it at any desired inclination, which it may be necessary to vary according to the quality of the flour.

After the sponge has undergone the process of kneading in the bin *i*, it is then to be returned again to the inclined plane by means of pumping, as the Patentee states; and after being subjected to a second operation of kneading upon the inclined plane *d*, it is delivered into a box mounted on rollers, having a moveable bottom, through which the dough may be discharged.

This box, moving upon rollers, is, with the dough, to be brought to a certain part of the bakehouse, and the dough then let out at its bottom on to another inclined plane, down which it slides into a machine, which the Patentee denominates a dough press.

This dough press consists of a strong wooden vessel, having a plunger fitted accurately to its interior. A pinion taking into a rack affixed to the back of the plunger causes it to be worked up and down.

By the descent of the plunger the dough is pressed, which assists in more perfectly combining the materials. When sufficiently pressed, the dough is made to exude through the bottom of the vessel by the force of the plunger, and it is delivered on to a flat mould board.

This mould board, with the dough, is advanced upon a railway, and brought to a certain part, where a cast-iron plate, having rectangular ribs on its under side, is made to descend by means of racks and pinions, and to press upon the dough for the purpose of spreading it out, and of partially dividing it into portions for the formation of separate loaves. The cast-iron plate is then raised up from the dough, and the mould board, with the dough upon it, is advanced farther upon the railway. Another flat board, intended to operate as a peal, is now placed upon the dough, with a cloth or web extended in a double over both surfaces; and by means of machinery, the mould board, with the dough and the peel, are altogether turned over vertically upon pivots, the peel now occupying the former place of the mould board, with the dough resting upon it, and upon the extended web or cloth, the mould board is then to be withdrawn.

The dough, on being again advanced upon the railway, is brought under another cast-iron plate, with rectangular ribs or partitions, which, being brought down by racks and pinions as before, causes the dough now to be completely separated into a certain number of loaves, the size and weight of each of which must, of course, depend upon the distance of the partitions on the moulding plates.

The loaves thus formed and placed upon the peel are now ready to be introduced into the oven, which is done by sliding the peel forward; and in order to deposit the loaves successively upon the floor of the oven, the cloth on which the loaves were placed is gradually drawn back under the peel, bringing the peel back with it, and leaving the loaves to be baked in the oven in the regular order in which they were formed on the mould board.

The specification concludes by stating the following particulars as the points of novelty claimed:—"The mode of making the sponge and kneading it; the method of forming the loaves of the required size, by first cutting the dough half through by a mould, and then turning it over, and cutting on the other side by a similar mould; and also the mode of introducing the loaves into the oven, depositing them therein, and removing the peel from beneath by means of a cloth or web wound upon a roller."—[*Inrolled in the Inrolment Office, April,* 1832.]

To John Ramsey, *of Caroline-place, Mecklenburgh-square, in the parish of St. Pancras, and county of Middlesex, Esq., for his invention of certain improvements in apparatus for turning over the leaves of music and other books.*—[Sealed 26th February, 1834.]

This apparatus, for turning over the leaves of music books, is of the same kind as those which we have before described under the patents of Mr. Chancellor and of Mr. Louis (see "London Journal of Arts," vol. ix., Second Series, page 145).

The invention is the adaptation to a music or reading stand of a piece of mechanism, consisting of a series of spring levers with strings, which are to be severally placed between the leaves of the book, and are turned over one at a time by touching a trigger.

The Patentee described his invention as consisting in "a combination of mechanical improvements and apparatus," the construction of which is shown in several figures of the drawing accompanying his specification.

Plate XII., fig. 12, represents a book opened upon a reading or music stand, the apparatus for turning over the leaves being placed in a box under the ledge or book rest of the stand; which apparatus consists of several levers *a*, *a*, *a*, with a silken cord *b*, extending from the end of each. These cords are passed up between the leaves of the book, and are fastened at top to a pin or hook *c*, in the stand. The levers are each drawn by a spring *d*, as shown in the horizontal view, fig. 13; but when they are set for action, a small catch *e*, stops each lever, and holds it back toward the right hand, until released from the catch, which is effected by striking a trigger *f*, below; and the force of the spring, when the lever is released, throws the lever *a*, and its cord *b*, over toward the left, and causes the cord to turn the leaf of the book over with it. When the open pages of the book have been read, the reader or performer touches one of the triggers *f*, by which means the catch is drawn back, and the lever allowed to turn over into the situation shown by dots.—[*Inrolled in the Inrolment Office, August*, 1834.]

To THOMAS BARRATT, *of St. Mary Cray, in the county of Kent, paper-maker, for his having invented certain improvements in machinery for making paper.*—[Sealed 31st August, 1830.]

THIS invention is a machine or apparatus for manufacturing paper in a continuous sheet, having the water-mark and maker's name thereon, and resembling in every respect paper made by hand in moulds the size of each separate sheet. Fig. 14, Plate XII., represents a section of the working parts of a machine constructed for this purpose, in which *a*, *a*, is one of the side frames, suspended by a hollow shaft on the main driving axle *b*, of the machine, which gives motion by suitable gearing to a small shaft *c*, above, having two excentrics *d*, mounted thereon, working in the slots *e*, of the side frames, and giving that vibrating or oscillating motion to the frame which is necessary for the equal distribution of the pulp flowing upon the endless wire web *g*. On this wire web, at equal distances apart, repetitions of the maker's name, or other device, is placed, according to the size of the paper required when cut up into single sheets. A series of rollers *h, h, h,* support the wire web, which rollers are of small diameter, in order that they may readily draw off the water from the pulp or stuff; and to promote this still more effectually, there are small metal forks or conductors fixed between the rollers. Motion is given to the bed roller *l*, by the spur wheels *m, n,* and *o*, (shown by dotted circles from the main driving axle *b*,) which draws or actuates the endless wire web: *p*, is the pulp trough; *q*, an apron leading therefrom, for the purpose of conducting the pulp on to the endless web; *r, r,* two tension rollers, adjustable on the arms *s, s,* for the purpose of keeping the web stretched over the conducting and drawing rollers.

A deckle strap *t*, is extended over rollers and over a small pulley on the spindle *v*, supported by arms projecting from the framework. Rotary motion is given to the deckle strap from the main axle of the machine by a rigger and band, which causes the strap to keep that part of the wire web over which it is placed clear of pulp, and thereby limits the size of the sheet of paper. By placing deckles at different distances stretched over the rollers and pulleys, the separation of the pulp for the production of sheets of paper of any required width may be effected.

The pulp suitably prepared flowing over the leather apron *q*, from the pulp trough *p*, and rendered fluid by the water, its fibres become spread over the surface of the wire web evenly, and produces a sheet of paper of an uniform and close texture, which, by passing onward under the pressing roller *w*, is made firm and compact, the water being pressed out of the pulp by that means, and which is then passed forward to the drying rollers, as is usual in paper manufactories.

The paper from a machine is generally wound round a reel, and is removed therefrom by being cut through transversely; that is, in the direction of the axis of the reel; but it is evident by this method of taking up the paper upon a reel or roller, each layer becomes longer, in consequence of the increasing diameter, as it winds upon the reel. Now, in manufacturing in this machine that peculiar kind of paper which is required to be cut into sheets of a precise dimension, and the mark of which must always be in a certain part of the sheet, the ordinary method of winding upon a reel or roll cannot be employed; to obviate, therefore, this inconvenience, the Patentee has invented a compensating reel, the diameter of which diminishes at each revolution, equal to the thickness of a sheet of paper. The construction of this reel is illustrated by figs. 15, 16, and 17.

Fig. 15, is an end view, shown partly in section; fig. 16, is a longitudinal section; fig. 17, is a diagram, illustrative of the actuating wheel-work. By the rotation of the reel revolving upon the stationary axle *a*, having a wheel *b*, fixed at its end, the spur wheel *c*, on the shaft *d*, is driven round; and this shaft *d*, being connected with the other similar shafts through spur gear, gives to the whole a corresponding rotary motion. On each of these shafts a bevel wheel *f*, is fixed, working into a similar bevel wheel on each of the radial arms of the wheel. The outer parts of these arms, carrying the ribs *i*, are connected to the inner parts of the arms by screw boxes; and the rotations of the wheels which turn the screws necessarily cause the arms to expand or contract, and thereby enlarge or diminish the diameter of the reel.

Previously to reeling on the paper, the arms of the reel are so adjusted, that the distance from one of the ribs *i*, to the next rib, shall equal the dimensions of each of the intended sheets; and the diameters of the wheels *b*, and *c*, are so arranged, that the rotation of the bevel wheels shall draw in the arms *h*, of the reel at each revolution, a distance equal to the thickness of the paper then in the progress of manufacture.

If the paper reeled in this way be afterwards cut at each rib, the sheets will be all of equal dimensions, and the marks as required be in the same place on each sheet.

The Patentee observes, that he does not limit the application of this compensating reel solely to the reeling and cutting of paper having water-marks thereon, but applies it also to ordinary wove paper, whereby the waste produced by the usual mode of reeling and cutting, when the sheets are required to be of the same size, is avoided.

The Patentee does not claim those parts of the machine described which are in common use, nor does he limit himself to the exact proportions or shapes shown in the drawings; but in order that his claims may be distinctly understood, he defines them under the six following heads:—

First, the mode of suspending the paper-making machinery by the hollow shaft, and giving it the requisite vibratory motion by means of excentrics; second, the adaptation of smaller rollers than have hitherto been used for conducting the water from the substance of the pulp; third, the introduction, for the same purpose, of wire forks or conductors between the said small rollers; fourth, the method of making paper of different widths by the same machine, by adjusting or inserting deckles according to the width required; fifth, the insertion of the maker's name and device into the endless wire web, so as to imitate and resemble paper usually made by hand; sixth, the invention of an adjustable contracting reel, as above described.—[*Inrolled in the Inrolment Office, February,* 1831.]

To William Wood, *of Summer-hill, in the county of Northumberland, near Newcastle-upon-Tyne, gentleman, for his having invented the application of a battering-ram to the purposes of working coal and other mines.*—[Sealed 23d December, 1830.]

This apparatus, which is very indifferently represented in the drawing accompanying the specification, consists of a horizontal frame, supported upon wooden legs, carrying a sliding wedge-formed pecker, made of hardened steel; which pecker is intended to be driven into the mass of coal by the repeated blows of a rammer, sliding also upon the frame, and worked by the hands of the miners.

It is proposed that, in order to fix this apparatus at any required elevation in the mine, a mound of small coals should be formed of a suitable height, and a wooden platform placed thereon to support the legs of the apparatus; and the frame may be further steadied, by pins driven into the roof or top of the mine.

The under part of the mass of coal intended to be separated is to be first excavated, and then the apparatus so placed, that the wedge-formed pecker may, by being driven in above, cause the mass to separate and fall down; and it may be readily conceived, that by the repeated blows of the hammer against the back of the pecker, slidden to and fro by the workmen, the pecker will be made to insinuate itself into the coal, and by its wedge-form to force a block of coal away from the other part of the mass.

The block in falling will be very likely to strike against the front leg of the frame; in order, therefore, to prevent mischief, the front leg is made with hinge joints, allowing it to fall back under such circumstances; but how the frame on which the pecker and the rammer slides is then to be supported, we do not see, unless the pins inserted into the roof of the mine are intended to sustain it, which they do not appear capable of doing.

It is observed that, in order to diminish the labour of the pecker, a hole may be first made in the mass of coal by means of a drill, into which the wedge-formed pecker is to be introduced.—[*Inrolled in the Inrolment Office, April,* 1831.]

To JOSEPH HARDWICK, *of Liverpool, in the county of Lancaster, gentleman, for his improvements in paddle-wheels.*—[Sealed 17th December, 1832.]

THE subject of this patent is a modification, we might, indeed, say a repetition, of some of the numerous schemes which have been proposed for giving to the paddles of a propelling wheel independent rotary movements, in order that they may be enabled to enter the water edgeways, so as to experience the least possible resistance:—pass through the water in nearly perpendicular positions, for the purpose of giving the most effective propelling stroke:—and quit the water edgewise also.

The Patentee states, that his invention relates to certain improvements added to an ordinary paddle-wheel, whereby he is enabled to cause the float-boards or paddles to enter and leave the water in the most advantageous positions, for applying the rotary power of the wheel in the most beneficial manner for propelling vessels on the water.

Plate XIII., fig. 1, represents a paddle-wheel revolving upon a central shaft, with six float-boards attached in the improved manner proposed by the Patentee: *a, a, a,* are the paddles or float-boards, each being fixed upon an axle mounted in the rings of the wheel. To the end of each of these paddle-axles a toothed wheel *c*, is affixed, and enclosed within a box *b, b, b.* The main shaft of the paddle-wheel passes through the centre of a stationary bevel-toothed wheel *d*, shown by dots, which is made fast to the side bearings or side of the vessel. A radial shaft or spindle *e*, is mounted within each of the arms of the wheel, and to the inner ends of these spindles a bevel-toothed pinion is affixed, taking into the concentric stationary wheel *d*; the outer ends of the spindles having each an endless worm, respectively taking into the toothed wheel *c*, on the paddle shafts.

It will hence be perceived that as the paddle-wheel goes round, the stationary wheel *d*, will cause all the spindles *e*, to turn, and by so doing, to give through their endless screws and the toothed wheels *c*, slow rotary motions to all the paddles *a*, upon their respective axles; which will place the paddles, as the wheel revolves, severally in the positions shown, on their arrival at the different parts of their rotation, and thereby cause them to pass into and out of the water edgewise, as required.

The Patentee says, "Now whereas, I would observe, that various means have at different times been resorted to for the purpose of causing the float-boards or paddles to take similar positions, I do not, therefore, claim the placing of the paddles or float-boards of paddle-wheels on axes, as above described, but only the means of giving the desired motion thereto; and I do declare, that my improvements consist in the application of the spindles *e*, *e*, with their screws and pinions actuated by the revolution of the paddle-wheel, as above described." —[*Inrolled in the Inrolment Office, June*, 1833.]

To Samuel Clegg, *of Sidmouth-street, Gray's Inn-lane, in the county of Middlesex, civil engineer, for his having invented or found out an improved gas-meter.*—[Sealed 20th October, 1830.]

The Patentee commences his specification by describing the principle and construction of the water-meter, of which he was the original inventor, and which, although it has been very materially improved both by himself and others, is yet inconvenient in many situations, and at all times uncertain. The present invention claims a less exceptionable application, being more uniform in its action. The construction is on the principle of the differential thermometer, or pulse glass.

The specification of this patent, drawn by Mr. Farey with his usual attention to minutiæ, would completely fill a volume of no inconsiderable bulk. We are first favoured with an essay on the philosophical theory of the pulse glass, which is the elementary principle of the meter before us; secondly, a description of the mode of adapting this principle to the purposes of a gas-meter; and, thirdly, an eligible construction of meter founded on this principle.

Fig. 19, Plate XII., represents a section of this improved meter; and fig. 20, a representation of the same, having the front plate, wheel-work, and index, removed: A, A, is the internal part of the meter or reservoir of gas; *a, a*, the bulb of the pulse glass, having the connecting tube bent in the shape of the letter *s*, and partly filled with alcohol, or any other fluid which boils at a low temperature. The atmospheric air contained in the upper part of the pulse glass is very rare, almost approaching to a vacuum; *b*, is a piece of metal tube, divided longitudinally into two portions, clasping the tube of the pulse glass, which pieces are tied together by soft copper wire. These pieces of tube are connected to the axle or spindle *c*, on which the whole is carefully poised; *d*, is a stout metal frame in the interior of the meter, through which the axle *c*, works, and is supported at each end. A flat tube *e*, is bent round the meter, for the passage of the gas from the main, which gas is delivered to the interior of the vessel A, by the short tube or mouth-piece *f*, above. The current of gas being thus directed, acts on the upper bulb of the pulse glass. A small bent pipe *g*, leads to a jet or burner *h*, for the purpose of supplying gas for combustion at that part of the meter; *i*, is a piece or plug of copper, or any other good conductor of heat, screwed into the frame *d*, immediately over the burner *h*. A bar *k*, *k*, is affixed in the middle to the axle *c*, and works round with it: *l*, *l*, are two pins, projecting from the ends of the bar *k*, *k*; and *m*, is a catch lever, to prevent the bar *k*, as it revolves with the axle and pulse glass, from retrograding. Another catch lever *n*, bears upon the end of the bar *k*, for the purpose of holding it; the two studs *p*, and *q*, prevent the catch levers *n*, and *m*, from descending too low, or being thrown too high, when the bar comes round. A pinion *r*, fixed on the axle *c*, is connected with the wheel-work of a counting machine, for the purpose of communicating the number of rotations of the pulse glass to the index or register. A cylindrical space *s*, *s*, is formed between the inner part of the meter or reservoir of gas and the external casing, to prevent the radiation of the heat from the interior; *t*, is the exit pipe, through which the gas passes off to the burners.

In order to explain the action of the meter, let it be supposed that the small burner *h*, is lighted, which will heat the piece of metal or conductor *i*, and also the internal frame *d*, and thereby raise the temperature of the gas in the interior of the meter A, A. The alcohol contained in the lower bulb and part of the bent tube will become heated accordingly; and the vapour, thus made to rise through the tube into the upper bulb, will be there condensed by the stream of cool gas issuing from the mouth-piece or short tube *f*. This operation of vaporisation and condensation, containing the alcohol forced from the lower bulb into the upper one, will cause the weight of the upper bulb, when filled, to exceed that of the lower one; and the centre of gravity of the pulse glass being thus brought above the level of the axle *c*, the whole will necessarily turn over, making half a revolution of the axle, and bringing the lower bulb of the pulse glass into the situation of the upper one.

This rotary action of the pulse glass, containing its speed, will be according to the relative temperature of the entering stream of gas from the main, and that of the gas in the interior of the meter. The Patentee says, that as the heat of the burner *h*, will, under all circumstances, correspond with the supply, the changes of position will always occur at regular periods.

Each change of the pulse glass is communicated by wheel-work, that is, a counting machine, connected to the pinion *r*, on the end of the axle *c*; and the quantity of gas flowing from the meter at each change requisite to supply any given number of lights (five for instance) having been correctly ascertained, the wheel-work is so adjusted, that the register on the dial-plate shall always correspond with the exact quantity consumed or passed.

The Patentee states, that he finds from experiment, that a meter supplying five lights, and consuming about twenty-five cubic feet of gas per hour, requires about one-fifth of a cubic foot to give sufficient heat to the interior; thus only about the one hundred and twentieth part of the gas registered is used to keep the meter in action.

In cold weather, the gas in the mains being reduced in temperature, would, by condensing the vapour in the upper bulb more speedily, cause a quicker action of the apparatus; but to prevent this, the Patentee causes the supply to pass through pipes *e*, *e*, made of thin metal, and of a flat shape, to expose as much surface in proportion to the contents as possible, in order to abstract heat from the warm gas in the interior of the meter; but as the gas passes quickly along the tubes *e*, there will still be sufficient difference in the temperature to maintain the requisite action of the pulse glass.

As the rotation of the apparatus will be in proportion to the surface of the supply pipe thus exposed, this affords another mode of adjusting the action of the meter.

The proper situation of the bulbs will be attained by the contrivance shown in the figure. The end of the catch lever *n*, resting on the end of the bar *k*, is bent inward, for the purpose of preventing the pulse glass turning, until there is sufficient alcohol in the upper bulb to counterbalance the resistance when it falls over, and acquires sufficient force to enable the reverse end of the bar to throw up the catch *m*, which is prevented from returning by the end of the catch falling down behind the pin *e*. The apparatus is then in such a situation, that the stream of cool gas will be directed immediately upon the upper bulb of the pulse glass, while the lower bulb is heated by the radiation from the plug *i*, and by the warm gas surrounding it.

By an ingenious combination of expansible metal rods and levers, a conical valve *u*, is made to rise from and open the exit pipe *t*, for the purpose of affording the supply, when the gas in the interior of the meter shall have become sufficiently heated to cause the regular action of the pulse glass; without this the gas consumed immediately after the first lighting of the small burner *h*, would not be registered; and hence, in the absence of this contrivance, the supply might be allowed to pass through the meter without the register being effected. To prevent the radiation of heat from the gas reservoir, it is enclosed by an outer casing, between which and the inner part of the meter is an open space *s*, which may be filled, if thought necessary, with any non-conducting substance.

The Patentee observes, lastly, that though the arrangement of the parts may be greatly varied, yet, in explaining the principle of this improvement as above, he has confined himself to that construction which he has found from experiments to be best suited to the purpose, and claims the combination of parts described, and the application thereof to this particular use.—[*Inrolled in the Inrolment Office, April,* 1831.]

To THOMAS HANCOCK, *of Goswell-mews, Goswell-street-road, in the county of Middlesex, water-proof cloth manufacturer, for his having invented or discovered improvements in the manufacture of certain articles of dress or wearing apparel, fancy ornaments and figures, and in the method of rendering certain manufactures and substances in a degree, or nearly, impervious to air and water, and of protecting certain manufactures and substances from being injured by air, water, or moisture.*—[Sealed 5th August, 1830.]

THERE are three subjects proposed under this patent: the first is the manufacture of an article that may be used as a substitute for cloth or leather, which shall be impervious to water and air; the second is the production of a plastic matter for casting or moulding images or figures from human forms, or other subjects; and the third is the coating or covering of various kinds of fabric or fibrous substances, with a material to render them partially impervious to water and air, and to protect the fibres from the destructive effects of damp.

The material constituting the basis of these several applications is caoutchouc (Indian rubber), which is to be employed, as the Patentee states, in the liquid condition, in which it exudes as a milky gum from its native trees in the East Indies, and in South America,* as described in his former patents of November, 1824 (see "London Journal," First Series, vol. x. page 22; and March, 1825, vol. xi. page 313).

The material to be made, as a substitute for cloth or leather, is a compound of this milky gum, caoutchouc, with fibrous matters, such as cotton, silk, flax, or hair, or the rags prepared by paper-makers for pulp.

To about every pound weight of the liquid gum, about one ounce of fibrous matter is to be added; the fibres being cut short, that is, averaging about one-eighth of an inch in length; these are to be completely mixed up and incorporated with the gum, which may then be poured out upon a flat tablet or plate, and allowed to dry into the form of a sheet. Colours may be incorporated with these liquid and fibrous materials, such as chrome yellow, cochineal, indigo, verditer, umber, Venetian red, or other materials, to give any required hue to the fabric when finished, and its sheets may be pressed or rolled, when dry, to produce a smoothness of surface; which rolls should be warmed to about the temperature of blood heat.

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* It is extraordinary, that in the several specifications of patents in which this material, caoutchouc, has been proposed to be applied in a liquid state, it has been almost invariably said, that the *milky gum in the natural liquid form in which it is discharged from its native tree*, is the material to be employed; whereas, it is notorious that the natural liquid gum has never been brought to this country, except in one instance, we believe, in a very small quantity, and then was found to be ineligible for the purpose; and that in all cases where liquid Indian rubber has been used as an article of manufacture, it has invariably been the bottle rubber, or cake rubber, dissolved in naphtha, or some other spirit, and not the native milky liquor (see Barnard's patent, and the notes appended thereto, vol. v. of our present series, page 382).—Ed.

The materials thus manufactured, may be employed for making boots, shoes, gaiters, caps, and a variety of other articles, such as coverings for loaded carts and waggons, it being perfectly impervious to water. The proportions of the fibrous materials to that of the gum, may be varied according to circumstances, as a greater proportion of the fibres may be necessary when the material is to be sown by the needle.

The substance, which is to be employed as a plastic material, is to be composed of the liquid gum caoutchouc, and earthy matters, such as whitening, ochre, brickdust, and emery, mixed in any proportions, according to the required hardness. Any of these earthy matters, first moistened with water, and then incorporated with the gum, will form a thick fluid consistency, which may be poured into plaster or other moulds, for the purpose of casting busts, figures, or any other forms, as ornamental devices.

If a hollow mould be prepared to produce a casting, the liquid compound is to be pressed into it, and made to spread itself over the entire surface in a thin coat, as in casting hollow figures in plaster of Paris; on their becoming dry, another coat of the same is to be spread over in like manner, and so on until a sufficient substance is acquired. An opening is to be left as a neck, into which bran, or sawdust, or other material, may be introduced, for the purpose of filling the interior of the cast, and rendering it solid and weighty.

Ornamental devices may be cast by this material in the same way, and may be employed as papier machée; and, if required, glue or starch, or dissolved gum Arabic, may be introduced and incorporated with the other ingredients, for the purpose of giving firmness to the subject or device formed in the mould.

In order to render fabrics of silk, cotton, or other fibrous texture partially impervious to water and air, the liquid gum caoutchouc is to be spread upon the surface of the goods either by a spatula or a brush, the fabric being first rendered flat, and tightly distended; or the goods may be dipped into the liquid. It is stated that the liquid may be diluted with water, in order to be laid upon such parts of the fabric as may not be required to be made so fully impervious as other parts; and that colours, such as solutions of indigo, or cochineal, or other materials, may be mixed with it, in order to give any required hue to the fabric; and if the dark colour of the Indian rubber should be objectionable, that may be removed by previously washing it with water.

We have read the latter part of this specification over several times, apprehensive that we might have mistaken the Patentee's intention, but find it there positively stated that water or aqueous solutions, as described above, are to be mixed with the materials. How this is to be effected we know not, as we have found that gum caoutchouc, however dissolved, becomes instantly formed into a solid consistency when water is introduced.—[*Inrolled in the Petty Bag Office, October,* 1830.]

To **Joshua Taylor Beale,** *of Church-street, Whitechapel, in the county of Middlesex, engineer, for his invention of a lamp applicable to the burning of substances not hitherto usually burned in such vessels or apparatuses.*—[Sealed 4th January, 1834.]

My invention consists of a lamp, of the application of certain fluids to be burned in the lamp, of a peculiar application of forced air, and of a peculiar application of heat; that is to say,

First, of a lamp without a wick or glass chimney, and of the application (for the purpose of being burned therein) of mineral naphtha, and any of the fluids obtained by distillation, and occasionally rectification from coal tar, vegetable tar, animal oil, turpentine, rosin, Indian rubber, and some other of the inflammable, oleaginous, or resinous substances; and of the application to the lamp of forced air, in the manner hereinafter mentioned. Second, of a lamp without a wick, and of the application (for the purpose of being burned therein) of modified essential oils, such as coal naphtha of the better kind, mixed with about two parts of strong alcohol, sixty per cent. over proof; or with about two parts of the fluids, called by chemists, pyro-acetic and pyro-xylic spirits, all of which I prefer in their strongest state, and such as essential oil of Indian rubber of the best kind, which will do without alcohol, or the above spirits, and of the application of heat in the manner hereinafter mentioned. Third, of a lamp without a wick, and of the application (for the purpose of being burned therein) of coal-tar naphtha, spirits of turpentine, spirits of vegetable tar, and similar fluids; and of the application of forced air, and the application of heat, in the manner hereinafter mentioned.

As to lamp No. 1, and the application of the fluids to be burned therein, and the application of forced air. The fluid is poured into a vessel or reservoir (upon the principle of the Argand lamp), from the bottom of which a feeding pipe communicates through a circular perforated base plate screwed thereon, whereby it can be made to rise or fall by turning it round, for the purpose of adjusting the distance of the cone from the surface of the fluid in the cup, to regulate the flame.

On the said feeding pipe is a receiver or cup, into which the fluid passes, and stands level with the fluid in the reservoir, at a height which is a little below the top edge of the cup; over the cup is placed a cone supported by a dome, the dome being supported by the base plate (through which the tube of communication passes, as aforesaid) attached beneath; and partly supported by an ordinary shelf, is an air pipe, connected with an apparatus supplying air. This air pipe should be about one-sixteenth of an inch in diameter in the bore, varying with the size of the lamp.

The air pipe communicates with and passes upwards through the feeding pipe, and through the cup containing the fluid. Air of sufficient density may be supplied by a single or double-acting air pump, or by any of the other well-known means of forcing air. To ensure the supply of a steady current of air, a quantity may be pumped or forced into a vessel similar to a common gasometer, or into a receiver with a safety valve to adjust the pressure; the stream of common air is thus forced through the pipe in the cup, and on the application of sufficient heat to the fluid in the cup, it becomes inflamed, and the vapour evolved burns brilliantly until the fluid is exhausted, or the current of air is stopped.

When the oil in the cup is of a coarse kind, I have found the ignition of it facilitated by pouring on it a very small quantity of some very volatile oil, such as coal-tar naphtha of the better kind.

The force of air required in the gasometer, or receiver, is one, two, or three inches perpendicular of mercury, according to the bore of the main pipe; and at the bottom of the pipe, at its point of ascent, is a fine-wormed screw bolt, which acts as a cock, and by means of which the supply of air is stopped or adjusted, and the light increased or diminished.

And, secondly, as to lamp No. 2, and the application of the fluids to be burned therein, and of the application of heat thereto. The fluid is poured into a vessel or reservoir, in communication with which is a common gas burner, with a valve at its base, and a cone and glass, the only other addition being a handle, for screwing and unscrewing the burner from the vessel. This lamp requires heat, to be applied through the medium of a small lamp placed under the vessel, or by steam (surrounding the reservoir with a steam-tight case), or by causing hot air to circulate about the same; but I prefer the small lamp, as being the most easy of management. When the fluid in the vessel boils, a vapour is evolved, which may be lighted as an ordinary gas light. The quantity of vapour evolved, depends on the right adjustment of the heat below the vessel in conjunction with the damper, as shown in the diagram; a very small relative flame being found sufficient after the fluid is made to boil. The lamp is enclosed by a double case; but requires no other external apparatus. When the vessel requires to be charged, the burner must be unscrewed by the handle, and a small funnel introduced.

And, thirdly, as a lamp No. 3, and the application of the fluids to be burned therein, and of the application of forced air, and the application of heat. The description of the lamp No. 2, and of the mode of applying heat is, in every respect, applicable to the lamp No. 3; but the following are the additional parts:—a pipe passes through a stuffing-box, and is made to rise and fall by being connected with a flexible tube of any suitable kind, or by joints, such pipe being supplied with air of sufficient density by any of the before-mentioned means. To overcome the column of fluid, I pass atmospheric air through the fluid, because it promotes evaporation, produces a greater magnitude of flame, and prevents the formation of soot. Care must be taken to apportion the application of heat to the reservoir.

The pipe is made so as to suit various oils, some being more volatile than others. Thus, when the oil is of a coarser kind, the pipe is made to descend to the lower part of the fluid, whereby evaporation is more promoted. If the fluid burned is of the better kind, it requires the application of a much lesser degree of heat to the reservoir than fluids of a coarser kind. Thus, if coal-tar naphtha of the better kind was the fluid used, the heat applied would be about 120 degrees of Fahrenheit, the heat applied depending on the quality of the fluid. For the purpose of further elucidating the several foregoing descriptions, I subjoin or annex a diagram in section of each lamp, that the various parts may be seen.

Fig. 1, shows the lamp called No. 1, in section; *a*, is the reservoir which supplies the fluid through the pipe *f*, to the level of the dotted line in the cup *e*; *b*, *b*, the base plate of the dome, which has a hole in the centre, with a screw cut in it, which revolves on the screw cut on the exterior of the feed pipe *f*; *c*, the dome surrounding the cup, as shown in the diagram, supported by the base plate *b*; *d*, the cone, supported by the dome; *e*, the cup, which should be placed perfectly level; *f*, the feed pipe; *g*, *g*, air pipe, about one-sixteenth of an inch in diameter in the bore; *h*, the shelf or support; *i*, the substitute for a cock, and by which the supply of air is adjusted. An overflowing pipe may be introduced to prevent the cup overflowing in case of the supply being too great, and a pipe to carry away the fluid that may overflow to any receptacle. Although not absolutely necessary, this pipe would guard against any such occurrence.

Fig. 2, shows the lamp No. 2, in section: *a*, a common gas burner, with cone and glass chimney; *b*, the valve for making the supply of vapour more steady; *c*, the vessel containing the fluid; *d*, a small lamp for heating the fluid; *e*, *e*, the double casing with a bad conductor of heat between them, such as atmospheric air; *f*, a cup round the base of the burner, to inflame a little spirits, to heat the same at first starting the lamp; *g*, *g*, small pipes to allow the vapour to pass off from the lamp; *h*, the damper, made to turn with the spindle at any angle, so as to modify the application of heat to the vessel *c*; *i*, *i*, *i*, are vent holes, to allow of a circulation of air; *k*, *k*, is an inverted funnel, which facilitates the escape of the carbonic acid in its descent.

Fig. 3, shows the lamp No. 3, in section, being precisely the same as the lamp No. 2, with the exception of the pipe *l*, *l*, to be annexed to the apparatus for supplying the air, such pipe passing through the stuffing-box *m*; *n*, is a cock for adjusting the supply of air.

I therefore claim as my invention, the lamp Nos. 1, 2, and 3, with the exception of such parts of it as were previously well known; I also claim as my invention, the before-mentioned application of forced air to the lamp Nos. 1, and 3. And I also claim as my invention, the before-mentioned application of heat to the fluid in the lamp No. 2. And I also claim as my invention, the application of the several before-mentioned fluids for the purpose of being burned in the lamp Nos. 1, 2, and 3, respectively.—[*Inrolled in the Inrolment Office, July,* 1834.]

To Sir THOMAS COCHRANE, *Knt., commonly called* Lord COCHRANE, *of Regent-street, in the county of Middlesex, for his invention of an apparatus to facilitate excavating, sinking, and mining.*—[Sealed 20th October, 1830.]

WE have rarely met with a more absurd scheme, both in principle and detail, than that which forms the subject of the above patent.

The invention consists in introducing air, and compressing it in a tunnel or mine, for the purpose of affording, by its expansive force, a means of supporting, or partially supporting, the superincumbent loose earth and water which might otherwise fall down or drain through, and, in time, fill up the tunnel or other cavity.

The Patentee observes, that a certain quantity of water and mud, or, as he terms it, "semi-fluid earth," will, by its gravity, drain off the upper parts and sides of the tunnel or mine, and descend to the bottom; he, therefore, makes a reservoir or cistern in the ground of the tunnel, into which he allows this water to drain.

The manner in which he proposes to get rid of this water or mud will be best understood by reference to the sectional drawing shown at Plate XIII. at fig. 5, which represents part of the bed of a river, under which a tunnel is constructing, with a perpendicular tube descending from above the high-water line in the river into the reservoir below; which tube is to be employed in raising the water, or semi-fluid earth.

The plan proposed for carrying this into effect, consists in forcing, by the agency of a suitable pump, a sufficient quantity of air into an enclosed part of the tunnel, which air, by pressing equally against the sides and top part of the tunnel, is designed to force the water or mud upwards, and partially prevent its draining through.

The bed of the river is shown in section at *a, a*; the tunnel at *b, b,* which it is proposed to construct underneath the bed of the river, in a manner similar to the Thames Tunnel at Rotherhithe; *c,* is a partition, having an air-tight door, which divides the tunnel into two parts, and closes the further part of the tunnel, as an air-tight chamber.

This chamber is supplied with air by means of a powerful force-pump, which injects the air through a horizontal pipe *d,* into the close chamber. The air thus forced into the close chamber of the tunnel will, it is stated, have the effect of partially supporting the water which might otherwise ooze through or drain off into the tunnel.

A perpendicular metal tube as a shaft *f,* the upper end of which is above the level of the surface of the water in the river, descends through the river and through the earth into the tunnel, the lower end of which tube dips into the basin or reservoir *e,* formed in the bottom. It is intended that the expansive force of the compressed air, acting upon the surface of the water in the basin or reservoir *e*, shall raise the water and mud from the reservoir as it accumulates, by draining from the top and sides, and so keep the interior of this part of the tunnel or mine free *and dry*.

It is also proposed, that the workmen employed in the close chamber of the tunnel, shall be supplied with bricks, mortar, tools, and other articles for their use, by passing them through this tube or shaft, and which, when fallen into the basin or reservoir, may be taken out of the water without disturbing the state of the air in the chamber or closed part of the tunnel.—[*Inrolled in the Inrolment Office, April,* 1831.]

To THOMAS SERLE, *of Coleman-street, in the city of London, merchant, for certain improvements in boilers for generating steam, being a communication from a foreigner residing abroad.* — [Sealed 11th October, 1834.]

THE boiler proposed by the Patentee is of a cylindrical form, standing upright, the furnace and flues being within. The water chambers or channels rise from a conical bottom formed by inclined tubes, and consist of a large tube or cylindrical chamber extending upwards in the centre of the boiler, and an annular chamber round the outer part: the flues carrying up the smoke and heated vapours from the furnace, passing between the inner and outer chambers, and the water flowing freely to and from both chambers through several series of radial pipes placed horizontally one above the other; which arrangement is considered to be highly advantageous for communicating the heat of the furnace with the best effect to the boiler, and for affording a free circulation of the water therein.

Plate XIII., fig. 6, represents the boiler in section, taken vertically through the middle; fig. 7, is a horizontal section of the same, taken through the radial pipes; *a, a,* is the outer cylindrical surface or case of the boiler; *b, b,* an inner cylinder, forming the annular water chamber *c, c,* round the outer part. The central water chamber *d,* is a tube, which has lateral communications through the radial pipes *e, e.*

The furnace *f,* is supported by fire bars, and is surrounded by fire bricks; *g,* is the ash pit; and *h, h,* are inclined tubes, or a conical roof to the furnace, having apertures, through which the smoke and heated vapours pass to the flues *i, i, i, i,* and thence to the chimney *k.*

The heat of the fire acts most forcibly against the inclined tubes or conical roof *h,* and causes the water, as its temperature increases, to ascend through the central tube *d,* to the upper part, where the steam is given off into the dome top of the boiler, and passes thence by a pipe *l,* to the working cylinder of the steam-engine; the pipe *l,* being furnished with a safety valve, to prevent accidental explosion.

Such portions of the water as have not been converted into steam, being of a lower temperature, descend through the outer or annular chamber *e, e,* and are again brought into contact with the bottom of the boiler; the circulation is also further promoted by the lateral radial pipes *e, e.*

Any impurities in the water, such as earths or salts, on becoming concentrated, will descend, and instead of adhering to the surface of the metal, as in ordinary boilers, will descend, and be deposited in the lower parts of the annular chamber *e, e*, where they will be but little, if at all, acted upon by the fire, can produce no mischief, and may be readily withdrawn by a pipe and cock, or may be blown out by the steam, when required.

It may also be remarked, that the Patentee has not thought it necessary to show the mode of supplying water to the boiler, nor of regulating the quantity, as those things are well understood, and form no part of his invention.

In conclusion, the Patentee states, "I do not claim the causing of the water to circulate in a steam boiler, various contrivances for that purpose having been before used; but I do hereby declare, that the improvements claimed, under the abover-ecited Letters Patent, consist in the application and combination of the circulating pipes or tubes within the flue of a boiler, such flue being itself within the boiler, as above described, whereby an advantageous circulation of water will take place."—[*Inrolled in the Inrolment Office, April*, 1835.]

To SAMUEL PARKER, *of Argyle-street, Oxford-street, in the county of Middlesex, bronzist, for his invention of certain improvements in apparatus for making extracts from coffee and other substances.*—[Sealed 11th January, 1833.]

THE coffee-pot which forms the subject of this patent, is represented as an improvement upon a certain construction of vessels for the same purpose previously known, and in use in France. Plate XIII., fig. 8, is a section of the pot, taken vertically. Within the pot, and forming its lower part, is a vessel *a,* containing water, which is made to boil by the flame of a lamp *b,* placed in a compartment below, forming the base or stand of the coffee-pot, or it may be removed and placed over a fire.

A vessel *c,* called the coffee-box, is intended to contain ground coffee, which, with its descending pipe *d,* is screwed into a collar at the top of the vertical tube of the boiler, the joint being packed to render it air-tight. The lower part of this pipe *d,* is partially immersed in the water of the boiler; and when, by the heat of the lamp *b,* or by a fire, steam is generated within the boiler, the pressure of the steam causes the water to be forced up the pipe *d,* through the coffee in the vessel *c,* and through the strainer *e,* at top, whence it falls into the reservoir *f.*

The boiling water thus passed through the vessel *c,* takes up as an infusion such parts of the coffee as are conducive to the production of an agreeably flavoured extract; and when such a quantity of water has been raised, and passed through the pipe *d,* and vessel *c,* as shall be sufficient to extract all the estimable part of the coffee contained in the box, the water, by rising up the pipe *d,* will have sunk in the boiler below the end of the pipe, consequently no more water will pass.

The lid *e,* of the coffee-box or vessel *c,* fits on tightly, and is fixed by a bayonet fastening, the upper part of the lid being perforated, and a woollen cloth placed within to prevent the coffee grounds passing through with the extract.

The Patentee particularly desires it to be observed, that a great object is to prevent the extract boiling upon the grounds, as the moment it boils the agreeable aromatic flavour of the coffee flies off in vapour, and a nauseous bitter extract of the woody part of the coffee immediately impregnates the infusion, greatly to its detriment.

One ounce of good coffee should not have more than four ounces of water passed through it, as the extract obtained from that quantity of coffee would become poor and ill-flavoured by applying a greater quantity of water.

The lamp *b*, is to be inflamed by spirit; and in order to raise or lower the flame as may be required, the nozle or burner is acted upon by an inclined plane, which is to be turned round to effect the adjustment of the heat against the bottom of the boiler.

This apparatus is also applicable to making extracts from tea, and other vegetable matters; but it must be observed at all times, that if the extract is allowed to boil, its qualities will be injured.

The extract thus obtained and let fall into the reservoir *f*, may be poured out thence at the spout of the pot; and if the infusion is stronger than may be required, boiling water may then be added to dilute it, or hot milk, if that is necessary, as in producing "*Café au lait.*"—[*Inrolled in the Inrolment Office, July*, 1833.]

To THOMAS GAUNT, *of Bridport-place, Hoxton, in the county of Middlesex, gentleman, for his invention of an improvement in earthenware pans or basins of water-closets, and certain other earthenware vessels to which such improvements are applicable.*—[Sealed 12th August, 1834.]

THIS invention consists in closing the top of a chamber-pot, or pan, or basin of a water-closet with an air-tight lid, to prevent the escape of any disagreeable effluvia. The way in which this is proposed to be effected, is by having a circular groove formed round the outer rim of the vessel, and a flange round the edge of the lid, which groove in the vessel is to be filled with water, and when the lid is put on, the flange of the lid in falling into the trough or groove, produces an air-tight water valve. This invention is applicable to close-stools, night-stools, slop-pails, which the Patentee calls closetieres, and other articles which may be used for the like purposes. The improvements, though rather elaborately set out by the Patentee, and accompanied by a large sheet of drawings exhibiting his plans in detail, are so obvious, that we do not consider any further illustration necessary.—[*Inrolled in the Rolls Chapel Office, February,* 1835.]

To JOEL BENEDICT NOTT, *late of Schenectady, in the State of New York, but now of Bury-street, St. James's, in the county of Middlesex, Esq., in consequence of a communication made to him by a certain foreigner residing abroad, for an invention of certain improvements in the construction of a furnace or furnaces for generating heat, and in the apparatus for the application of heat to various useful purposes.*—[Sealed 4th November, 1831.]

THE subjects of this patent are, first, a close stove, applicable to the heating of churches, large rooms, offices, and other capricious places; and, secondly, the adaptation of the same sort of stove to a peculiar construction of boiler for generating steam.

The specification of this invention is of an extravagant length, explaining, with considerable verbosity and consequent deficiency of clearness, the constructions and uses of the various parts of the apparatus represented in the drawings, comprehended in forty-one figures. The first division of the subject, the construction of the stove, is described under seventeen heads; but as this ramification of detail is altogether useless, we shall explain the whole affair by reference to a section of the stove taken vertically, shown at fig. 9, in Plate XIII.

The external parts of the stove are proposed to be of cast-iron; the general form of arrangement shown appears to be essential, but not the exact shape or external decoration. The stove is intended to burn a refuse quality of small coal; in the United States, it is said to have been principally used to consume *anthracite* glance coal, or blind coal.

The base of the stove and furnace *a*, is of a rectangular form; the fire-bars or grating *b*, consists of rings or segments of wheels fixed upon an axle, which may be turned by a winch on the outside, whenever the dust and ashes require to be discharged into the box *c*, below. The fuel is to be introduced through the top, by removing the cover *d*; and in order to keep the top as nearly air-tight as possible, the plate *e*, is introduced, which is to fit the sides accurately; the air for supporting combustion being admitted by partially drawing out the box *c*.

In the front of the stove at *f*, a grating of perpendicular bars is made, which is covered with a sheet of *mica* or *talc*, closing the stove, and keeping the red-hot coals from falling through, yet allowing the fire to be visible; and *g*, is the chimney or flue, the mouth of the chimney being so situate, that all the gas and smoke generated from the mass of coal above, must pass through the live coal, and be consumed. The parts of the stove which are most exposed to the action of the fire, are guarded by fire-bricks *i*, *i*, *i*.

The novel features particularly claimed by the Patentee in this part of the invention, as applied to furnaces, are the circular bars, or cylindrical or polygonal grate, the axle on which the grate is enabled to turn, and the sheet of talc, or mica, placed against the front grating.

The second part of the invention consists of a boiler, the water vessels of which are formed by vertical tubes, and this being connected to a stove of the construction above explained, the heated vapour and smoke from the furnace causes the steam to be generated. The novelty here claimed is the union of such a boiler with such a stove.—[*Inrolled in the Inrolment Office, May*, 1831.]

To JOEL BENEDICT NOTT, *of Liverpool, Esq., in consequence of a communication made to him by a certain foreigner residing abroad, for an invention of certain improvements in the construction of a furnace or furnaces for generating heat, and in the apparatus for the application of heat to various useful purposes, being further improvements upon a patent obtained by the said Benedict Nott, dated the 4th day of November,* 1830.—[Sealed 22d December, 1831.]

THIS, as expressed, is an improvement upon the preceding patent. There is no drawing appended to the specification, but it sets out that the improvements consist in the five following subjects:—

First, instead of the ignited fuel being supported by an open grating of hoops, as described in the former

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specification, it is now proposed to support the ignited fuel by a solid cast-iron cylindrical or polygonal plate, without apertures, for the passage of air, as before; and, secondly, that the air necessary for supporting the combustion of the fuel shall be supplied by an air passage from behind, opening into the midst of the ignited fuel; and, thirdly, that a damper or air valve shall be adapted to regulate the draft.

The fourth feature of improvement applies to the boiler connected to the stove, in which the vertical water tubes are to be extended upwards above the water line of the boiler.

The fifth suggestion is, that lateral pipes or passages shall be made from the boiler, leading off into vats, for the purpose of conducting any matter that may be crystallized in the boiler. We do not perceive whether this is to be applied when using sea water, or whether designed for the concentration of sugar and salt; indeed, neither the construction or use of this apparatus is set out in a way that affords satisfactory information. —[*Inrolled in the Inrolment Office, January*, 1832.]

To JAMES HARTLEY *and* JOHN HARTLEY, *both of West Bromwich, near Birmingham, glass manufacturers, for their invention of a certain improvement or certain improvements in the manufacture of glass.*—[Sealed 22d October, 1834.]

THIS improvement applies to the *modus operandi* of manufacturing ordinary window glass, called crown glass.

The Patentees say, "It is well known that this description of glass is produced from the metal by blowing it first into the form of a globe, and afterwards by means of the operation called 'flashing' (spinning it round, and causing it, by the centrifugal force, to expand into the form of a flat circular tablet), such globes are thrown open into flat circular plates. Now, our invention relates to that part of the process of manufacture which consists in blowing the metal into globes."

According to the ordinary process, the metal, when taken from the pot by the pipe, is rolled on a smooth iron surface, in order to bring the outer end of the metal into a conical form, the extreme end of which, called the bullion, becomes the outer axis (query pole) of the globe, during the operation of blowing and working the glass into the required form.

During the expanding of the metal into the globular form the workman rolls the bullion along a straight edge or bar, called the bullion bar, as is well understood. In doing this, the outer part of the glass globe, whilst expanding and continually revolving, rubs against the bullion bar, by which action parts of the surface of the glass is disturbed or made irregular; and as the globe extends in dimensions, this rubbed surface enlarges; the consequence of which is, that when the table of glass is complete, there are at all times more or less waved lines for some inches round the bullion, or the centre of the table of glass, which lessens the value of so much of the table.

Now the object of this invention is to dispense with the bullion bar, and to supply its place by the application of a tube or hollow bearing for the bullion or outer axis of the globe of glass during the expansion of the same. By this means the part of the surface which was heretofore rubbed against the bullion bar, is, when worked according to our invention, in no way prejudicially acted upon, and the waved appearance before, consequent on the manner of operating, is avoided.

Plate XIII., fig. 10, represents an ordinary pipe with a globe of glass, the bullion *a*, being supported by the tube *b*, in which it is caused to revolve by the workman when working the metal into a globular form during its expansion. On the tube *b*, is placed a shield *c*, which is intended to prevent the heat coming from the heated glass injuring the hands of the boy who holds the tube.

The workman, in performing this part of the process of manufacturing glass, takes a proper quantity of metal on the end of the pipe, and proceeds to form the end of such metal into a cone. He proceeds with the outer process in manner heretofore pursued, until the globe of glass requires support at the outer end by its axis or bullion *a*; that is to say, he proceeds in the ordinary manner up to the period at which, according to the old mode of operating, the bullion would have been rested on, and revolved, and run along the bar: but now, instead of its so running along the bar, a boy holds the tube or hollow bearing *b*, in such a manner, as to receive the bullion *a*; and the workman causes the globe to revolve till it is sufficiently expanded; it then undergoes the operation of flashing.

In conclusion, the Patentees say that their invention consists in "the application of the tube or hollow axis *b*, in place of running the bullion along the straight edge called the bullion bar."—[*Inrolled in the Inrolment Office, April,* 1835.]

PROCEEDINGS BEFORE THE PRIVY COUNCIL,

For extending the Term of an existing Patent under the Fourth Clause of the New Patent Law.

The first application for extending the term of an existing patent brought before the Privy Council, was by the petition of Pierre Erard, of Great Marlborough-street, London, musical-instrument maker to his Majesty and the Royal Family.

The petitioner stated that he is nephew and successor to Sebastian Erard, the inventor and patentee of several important improvements in harps and piano-fortes; that the petitioner, in conjunction with his uncle, had devoted much time and study to the construction of musical instruments, particularly the harp and piano-forte; that in 1810 they introduced a double-action harp, and have since given great attention to the improvement of piano-fortes. At that period there were two sorts of instruments in use, the *grand* and the *square* piano-fortes. Each had its own peculiar arrangement of mechanism, called the *action*, for communicating the touch of the keys to the strings. The square piano-forte was without any check or stop to the hammer, which afforded great facility in the performances of quick passages, but allowed the hammer occasionally to rebound, and thereby interrupt the harmony. The action of the grand piano-forte had a check to receive the hammer, but was slow in repeating; and though possessing great power of tone, was incapable of executing rapid music in a perfect manner.

To remove these defects, the efforts of the petitioner and his uncle have been for many years devoted, and ultimately, he invented an improvement on piano-fortes, for which he obtained patents, dated 22d December, 1821, in England; 6th April, 1822, in Scotland; and 14th December, 1822, in Ireland: that the petitioner has, since then, expended upwards of Fifteen Thousand Pounds in bringing this improvement to perfection, and introducing it to the public; and that, from opposing prejudice and conflicting interests, he has not been able to establish this invention in the perfect good opinion of the public until very lately; and that, consequently, the term of his patent is now about to expire, without his having obtained a return of profit at all equal to the amount of his great expenditure, and without any remuneration for his talent and exertions. The Patentee has also obtained Letters Patent in 1825, for applying the same improvements to other descriptions of piano-fortes, and for a peculiar mode of bracing the instrument, unconnected with the former invention. The petitioner, therefore, humbly prayed, that his Majesty would be graciously pleased, under the advice of his Privy Council, to grant him a prolongation of his exclusive right to make, exercise, and vend, the said invention for seven years after the expiration of his several existing patents, of which the Privy Council were now to consider, and to report to his Majesty.

The Council assembled, consisted of Lords Lyndhurst and Brougham, Baron Parke, and Sir Thomas Erskine.

The counsel at the bar, on behalf of the petition, were Mr. Charles Cresswell and Mr. Jonathan Peel.

Lord Lyndhurst, after the business had been opened, inquired of the petitioner's counsel, if the Attorney-General had received notice of the petition; but was informed, that no such formality was required by the letter of the Act. His lordship observed, that great responsibility was thrown upon their lordships, by adjudicating on this case, in the absence of the Attorney-General. His lordship then inquired for the specification and drawings, but was informed, that these were unnecessary on the present occasion, as the extension of the patent would not effect its validity. Their lordships, however, considered that some evidence should be adduced to show the petitioner's compliance with the provisions of the patent; and the specification being in court, was then brought forward with drawings and models.

The petitioner's solicitor, on being called, proved that notice had been given in the *Gazette* and newspapers, according to law, of his intended application for an extension of the terms of his patents. A book-keeper was called to prove, that he had expended large sums of money in perfecting the invention; the disbursements yearly, from 1821, were produced, from which it appeared that the petitioner had expended upwards of 3,000*l.* before any return was received: that the first return was in 1826. The witness was closely examined, as to the mode in which the accounts were made, and stock valued; whether the money was expended in working the patent, or in preliminary preparation; and whether the instruments could now be made at a saleable price. Lord Lyndhurst, after this close examination of the witness, expressed himself entirely satisfied with this part of the case.

Witnesses were then called to explain the construction of the instrument from the drawings and models, and to set out its advantages, as well as to prove that the expense of its manufacture was two-thirds greater than that of the old instrument; yet the petitioner sells his improved piano-fortes at the same prices as the old makers.

Several eminent performers, foreign and English, were then called to prove the superiority of the petitioner's improvement, some of whom played upon the instrument in court. They also spoke to the comparative merits of this and other constructions of piano-fortes, and particularly to its durability and retention of tune, under great variations of temperature, in foreign climates.

The Court having deliberated upon the evidence in the absence of the counsel and witnesses (there being no opposition to the petitioner from any caveat), on again opening the doors, Lord Lyndhurst delivered judgment by saying, "That, on consideration of the whole circumstances, their lordships thought that a sufficiently strong case had been made out, both on the score of hardship, and on the merits of the invention, to justify their lordships in recommending his Majesty to extend the patent of 1821 for a further term of seven years; but that they were of opinion that no case had been made out as to the patent of 1825."

His lordship added, "that in all such cases, the Privy Council would require a strong case of hardship to be made out, as well as a strong case upon the utility of the invention."

A new patent, for a term of seven years, is, in consequence, now in course of proceeding, agreeable to all the usual forms and charges of stamps and fees, which will be issued under the Great Seal in a few days, limited, of course, to the original title and specification.

New Patents
SEALED IN ENGLAND,
December, 1835.

To Charles Pearce Chapman, of Cornhill, in the city of London, zinc manufacturer, for his invention of improvements in printing silks, calicoes, and other fabrics. —Sealed 24th November—6 months for inrolment.

To James Helliwell, of Springfield-lane, in the borough of Salford and county of Lancaster, dyer, for his invention of an improved process or manufacture, whereby the texture of cotton, and certain other fabrics and materials, may be rendered impervious to water.——Sealed 28th November—6 months for inrolment.

To Humphrey Jefferies, of Birmingham, in the county of Warwick, goldsmith and jeweller, for his invention of certain improvements in buttons.—Sealed 28th November—6 months for inrolment.

To Thomas Robert Sewell, of Carrington, in the parish of Basford, in the county of Nottingham, lace manufacturer, for his invention of certain improvements in machinery for making lace, commonly called bobbin-net.—Sealed 2d December—6 months for inrolment.

To James Cropper, of the town and county of the town of Nottingham, lace manufacturer, and Thomas Brown Milnes, of Lenton Works, in the county of Nottingham, bleacher, for their invention of certain improvements in machinery for manufacturing lace or net commonly called bobbin-net lace.—Sealed 3d December—6 months for inrolment.

To William Wainwright Potts, of Burslem, in the county of Stafford, for his invention of an improved method or process of producing patterns in one or more colours to be transferred to earthenware, porcelain, china, glass, and other similar substances.—Sealed 3d December—6 months for inrolment.

To Bennett Woodcroft, of Ardwick, in the parish of Manchester, in the county of Lancaster, gentleman, for his invention of improvements in printing calicoes and other fabrics, whether manufactured of cotton, silk, wool, or linen, or of all or any two or three of those materials.—Sealed 3d December—6 months for inrolment.

To Thomas Parkin, of Dudley, in the county of Worcester, gentleman, being a member of the sect called Separists, for his invention of certain improvements in sleepers or bearers applicable to railroads.—Sealed 3d December—6 months for inrolment.

To Alexander Gordon, of Fludyer-street, in the city of Westminster, member of the Institution of Civil Engineers, and James Deville, of the Strand, lamp manufacturer, for their invention of certain improvements in the production, maintenance, direction, or distribution of lights, parts of which improvements are applicable to other purposes.—Sealed 3d December—6 months for inrolment.

To Richard Witty, of Stoke-upon-Trent, in the county of Stafford, civil engineer, for his invention of an improved method or methods of arranging and combining certain materials used in constructing houses, bridges, and other buildings, whereby superior strength and durability will be obtained.—Sealed 3d December —6 months for inrolment.

To James Radley, of Oldham, in the county palatine of Lancaster, gentleman, for his invention of certain improvements in the construction of gauges for indicating or measuring the expansive pressure of steam, or other elastic vapours or gases used expansively as a medium of power.—Sealed 4th December—6 months for inrolment.

To Miles Berry, of Chancery-lane, in the county of Middlesex, civil engineer and mechanical draftsman, for a certain improvement or improvements in power-looms for weaving, being a communication from a foreigner residing abroad.—Sealed 5th December—6 months for inrolment.

To Nathaniel Partridge, of Elm-cottage, near Stroud, in the county of Gloucester, gentleman, for his invention of the application of a certain composition paste, or materials as an anti-attrition, applicable to the bearings of wheels and machinery generally.—Sealed 7th December—6 months for inrolment.

To Robert William Sievier, of Henrietta-street, Cavendish-square, in the county of Middlesex, gentleman, for his invention of an improved water-proof cloth or fabric, made either elastic or non-elastic, applicable to various useful purposes, and for an improved manufacture of water-proof hats or caps.—Sealed 7th December—6 months for inrolment.

To Nathaniel Partridge, of Elm-cottage, near Stroud, in the county of Gloucester, gentleman, for his invention of a certain improvement or certain improvements in mixing and preparing oil paints, whereby a saving of ingredients commonly used will be effected.—Sealed 8th December—6 months for inrolment.

To John Samuel Dawes, of Birmingham, in the county of Warwick, iron-master, for his invention of improvements in the manufacture of iron by the application of certain known materials, and for improvements in preparing such materials, and for the recovery of certain products in the process of manufacturing iron.—Sealed 9th December—6 months for inrolment.

To Jeremiah Horsfall and James Kenyon, both of Addingham, in the county of York, cotton spinners, for their invention of certain improvements in engines used for carding cotton, wool, and other fibrous substances.—Sealed 9th December—6 months for inrolment

To John Bertie, of Basford, in the county of Nottingham, lace-maker, for his invention of certain improvements in machinery for making bobbin-net lace, for the purpose of producing ornamental net or lace of various kinds, part of which improvements are an extension of certain improvements for which Letters Patent were granted to him and one James Gibbons, bearing date the 5th June, 1834.—Sealed 9th December—6 months for inrolment.

To John Houldsworth, of Glasgow, in the county of Lanark, cotton-spinner, for certain improvements applicable to drawing and slubbing-frames used in the manufacture of cotton and other fibrous substances, being a communication from a foreigner residing abroad.—Sealed 9th December—6 months for inrolment.

To Lightly Simpson, of Manchester, in the county palatine of Lancaster, chemist, for his invention of an improvement in the preparation of certain colours to be used for printing cotton and other fabrics.—Sealed 10th December—6 months for inrolment.

To Frederick Hempel, of Prainenburg, in the kingdom of Prussia, doctor of chemistry, now residing in Great Portland-street, in the county of Middlesex, for his invention of certain improvements in oxidiging or oxidiniging certain animal or vegetable substances, and for separating the several and different parts of such substances, and to render them by means of different operations not only separately but also in combination with other materials capable of producing useful articles.—Sealed 15th December—6 months for inrolment.

To Daniel Dewhurst, of Preston, in the county of Lancaster, flax-spinner, and Thomas Hope, Joseph Hope, and Isaac Hope, all of Manchester, in the county of Lancaster, mechanics, for their invention of certain new and improved machinery for preparing flax and hemp, also certain new and improved machinery for spinning flax, hemp, cotton, silk, and other fibrous substances, by power.—Sealed 16th December—2 months for inrolment.

To William Carpmael, of Crawford-street, in the county of Middlesex, gentleman, for certain improvements in locomotive steam-carriages, part of which improvements are also applicable to steam-engines and boilers in general, being a communication from a foreigner residing abroad—Sealed 16th December—6 months for inrolment.

Robert Griffiths, of Birmingham, in the county of Warwick, for his invention of improvements in machinery for making rivets, screw-blanks, and bolts.—Sealed 16th December—6 months for inrolment.

To William Coles, of Charing-cross, in the county of Middlesex, Esq., for his invention of certain improvements applicable to locomotive carriages. — Sealed 16th December—6 months for inrolment.

To John Osbaldeston, of Blackburn, in the county of Lancaster, weaver, for his invention of an improved method of making a metal heald or healds for the weaving of silk, woollen, worsted, cotton, or any other fibrous substance.—Sealed 16th December—6 months for inrolment.

To Ovid Topham, of Whitecross-street, St. Luke's, in the county of Middlesex, engineer, for his invention of certain improvements in dressing, stearching, cleaning, and drying lace or net, known by the trade by the term of getting up lace or net.—Sealed 16th December —6 months for inrolment.

To John Warwick, of Three Kings-court, Lombard-street, in the city of London, merchant, for an improved lock and key, being a communication from a foreigner residing abroad.—Sealed 16th December— 6 months for inrolment.

To Henry Booth, of Liverpool, in the county of Lancaster, gentleman, for his invention of an improved method of attaching railway carriages together for the purpose of obtaining steadiness and smoothness of motion.—Sealed 16th December—2 months for inrolment.

To Pierre Erard, of Great Marlborough-street, in the county of Middlesex, for his invention of certain improvements on harps. — Sealed 18th December — 6 months for inrolment.

To John Baillie, of Great Suffolk-street, in the borough of Southwark and county of Surrey, engineer, and John Paterson, of Mincing-lane, in the city of London, gentleman, for their invention of improvements in propelling of vessels and other floating bodies by means of steam or other power.—Sealed 21st December—6 months for inrolment.

To Thomas Howell, of Clare-street, Bristol, for his invention of certain improvements in musical instruments.—Sealed 21st December—6 months for inrolment

To Nicholas Troughton, of Bread-street, in the city of London, merchant, for his invention of improvements in the process of obtaining copper from copper ores.—Sealed 22d December—6 months for inrolment.

To John Thomas Betts, of Smithfield-bars, in the city of London, rectifyer, for improvements in the process of preparing spirituous liquors in the making of brandy, being a communication from a foreigner residing abroad.—Sealed 22d December—6 months for inrolment.

To John Heathcoat, of Tiverton, in the county of Devon, lace-manufacturer, for his invention of a method or methods of weaving or manufacturing divers kinds of goods and wares, and for machines or machinery applicable thereto.—Sealed 23d December—6 months for inrolment.

CELESTIAL PHENOMENA, FOR JANUARY, 1836.

D. H. M.
1 Clock before the ☉ 3m. 35s.
— ☽ rises 1h. 55m. A.
— ☽ passes mer. 10h. 23m.
— ☽ sets 5h. 55m. M.
47 Juno oppo. ☉
11 9 ☉ in Perigee.
16 17 ♃ oppo. ☉
3 18 57 ♃'s first sat. will em.
4 1 5 Ecliptic oppo. or ○ full moon.
5 Clock before the ☉ 5m. 26s.
— ☽ rises 5h. 17m.
— ☽ passes the mer. 0h. 56m.
— ☽ sets 9h. 32m.
8 13 ♃'s fourth sat. will em.
13 26 ♃'s fourth sat. will em.
23 32 ☿ in sup. conj. with the ☉
7 7 54 ♃'s first sat. will em.
9 8 16 ♃'s second sat. will em.
11 45 ♀ greatest Hel. Lat. S.
10 Clock before the ☉ 7m. 36s.
— ☽ rises 11h. 36m. A.
— ☽ passes mer. 4h. 54m. M.
— ☽ sets 11h. 14m. M.
11 4 30 ☽ in □ or last quarter.
12 4 43 ♄ in conj. with the ☽ diff. of dec. 0. 26.
15 20 ♃'s first sat. will em.
14 9 49 ♃'s first sat. will em.
15 Clock before the ☉ 9m. 31s.
— ☽ rises 5h. 16m. M.
— ☽ passes mer. 9h. 11m. M.
— ☽ sets 0h. 58m. A.
14 7 ☿ greatest Hel. Lat. S.
16 3 ☽ in Perigee.
10 53 ♃'s second sat. will em.
17 Mercury R. A. 20h. 26m. dec. 21. 22. S.
— Venus R. A. 21h. 39m. dec. 15. 24. S.
— Mars R. A. 19h. 24m. dec. 22. 59. S.
— Vesta R. A. 12h. 20m. dec. 6. 25. N.
— Juno R. A. 6h. 24m. dec. 2. 17. N.
— Pallas R. A. 19h. 25m. dec. 2. 24. N.

D. H. M.
17 Ceres R. A. 20h. 15m. dec. 25. 13. S.
— Jupiter R. A. 6h. 38m. dec. 23. 15. N.
— Saturn R. A. 14h. 12m. dec. 10. 46. S.
— Georg. R. A. 22h. 4m. dec. 12. 37. S.
— ☿ passes mer. 0h. 42m.
— ♀ passes mer. 1 h. 55m.
— ♂ passes mer. 23h. 39m.
— ♃ passes mer. 10h. 53m.
17 7 1 ♂ in conj. with the ☽ diff. of dec. 3. 6.
18 8 28 Ecliptic conj. or ● new moon.
19 29 ☿ in conj. with the ☽ diff. of dec. 2. 46.
19 16 13 ♀ in conj. with the ☽ diff. of dec. 3. 40.
21 55 ♅ in conj. with the ☽ diff. of dec. 4. 38.
20 Clock before the ☉ 11m. 11s.
— ☽ rises 9h. 44m. M.
— ☽ passes mer. 2h. 19m. A.
— ☽ sets 7h. 5m. A.
22 8 24 ♃'s third sat. will em.
13 7 ♀ in conj. with ♅ diff. of dec. 0. 55.
23 6 12 ♃'s first sat. will em.
13 31 ♃'s second sat. will em.
25 Clock before the ☉ 12m. 32s.
— ☽ rises 10h. 58m. M.
— ☽ passes mer. 6h. 2m. A.
— ☽ sets 0h. 11m. M.
2 45 ☽ in □ or first quarter.
8 11 ♄ in quad. with the ☉
28 ☽ in Apogee.
13 38 ♃'s first sat. will em.
29 12 23 ♃'s third sat. will em.
30 Clock before the ☉ 13m. 32s.
— ☽ rises 1h. 7m. A.
— ☽ passes mer. 9h. 57m. A.
— ☽ sets 5h. 54m. M.
8 7 ♃'s first sat. will em.
16 8 ♃'s second sat. will em.

J. LEWTHWAITE, Rotherhithe.

METEOROLOGICAL JOURNAL,

FOR NOVEMBER AND DECEMBER, 1835.

1835.	Thermo.		Barometer.		Rain in inches.	1835.	Thermo.		Barometer.		Rain in inches.
	Hig.	Low.	High.	Low.			Hig.	Low.	High.	Low.	
Nov.						Dec.					
26	55	46	29,67	29,43	,15	11	31	15	30,21	30,15	
27	54	50	29,40	29,32	,15	12	34	15	30,22	30,19	
28	51	44	29,53	29.31	,6	13	39	26	30,23	30,22	
29	49	35	29,52	29.34		14	39	28	30,25	30,23	
30	55	45	29,18	29 14	,45	15	40	32	30,27	30,25	
Dec.						16	43	32	30,29	30,24	
1	53	42	29,37	29,34		17	39	28	30,28	30,21	
2	49	42	29,57	29,39		18	46	32	30,03	29,93	
3	52	31	29,65	29,60	,025	19	36	30	29,92	29,90	
4	47	38	29,85	29,65		20	34	28	29,97	29,89	
5	45	33	30,15	30,07	,025	21	33	27	30,15	30,04	
6	43	34	30,09	30,04		22	34	21	30,40	30,24	
7	42	28	30,07	30,04	,025	23	31	12	30,45	30,44	
8	43	33	30,03	29,74		24	31	26	30,28	30,33	
9	42	36	30,09	29,67	,15	25	28	10	30,30	30,27	
10	33	23	30,30	30,19							

Edmonton.

CHARLES HENRY ADAMS.

Latitude 51° 37 32 N.
Longitude 3 51 West of Greenwich.

THE

London

JOURNAL AND REPERTORY

OF

Arts, Sciences, and Manufactures.

CONJOINED SERIES.

No. XLVII.

Recent Patents.

To AMASSA STONE, *of Johnstone, in the county of Providence and State of Rhode Island, in the United States of America, machinist, but now residing in Liverpool, in the county-palatine of Lancaster, for his invention of an improvement on power and other looms, and in the weaving of silk, hempen, cotton, woollen, and other cloth.*—[Sealed 22d October, 1834.]

THIS improvement on power-looms, and other looms for weaving silk, hempen, cotton, woollen, and other cloths, consists in a new adaptation of mechanism to be attached to such looms for the purpose of connecting the operation of beating up the weft thread with that of giving out or delivering the warp, and taking up the cloth. By means of this improvement, whenever, from the accidental breaking or non-delivery of the weft or filling, the striking up of the reed meets with little or no resistance. The delivery of the warp, and also the taking up of the cloth, is suspended, although the general evolutions of the loom remain in action.

In order to render the construction and adaptation of this improvement perfectly evident, the Patentee has appended to his specification drawings representing a power-loom, or portions of a power-loom, in several positions, with the improvement connected thereto.

Plate XIV., fig. 1, is an end view of the loom, with the novel parts attached, and in working order; fig. 2, is a partial representation of the same, showing particularly the novel parts; fig. 3, is a vertical section, taken through the loom at right angles to fig. 1, in the line A, B, looking toward the cloth beam; fig. 4, is a vertical section, also at right angles to fig. 1, in the line C, D, looking in the opposite direction, that is, toward the warp beam; and fig. 5, is a horizontal view of a portion of the lathe of the loom, taken at that end where the improved parts are connected; the respective letters of reference pointing out the same parts in all the figures.

The warp beam *a*, is mounted upon an axle turning in bearings in the side standards or frames of the loom. From this beam the warp threads pass over a whip roller *b*, above, and thence through the headles or helds *c*, *c*, and reed *d*, in the ordinary way. The reed is mounted in the lathe with a frame, which is capable of vibrating on pivots or centres, for the purpose of allowing the reed to fall back when it strikes forcibly against the weft thread in beating up. The cloth produced by the intervention of the warp and weft threads in the front of the reed, passes over the breast beam *e*, to the work beam *f*, and is wound upon a loose roller *g*, by the friction of their surfaces.

The crank shaft *h*, by which the working parts of the loom are driven (through the agency of a rigger affixed at its end, and a band leading from a steam-engine, or other rotary power), is connected by the crank rods *i*, *i*, to the back part of the lathe; and hence, as the crank shaft rotates, the latter is made to vibrate in the usual way; and by the ordinary connexion of toothed wheels, the tappet shaft *k*, is also driven, which works the headles or helds *c*, *c*, that open the sheds of the warp, and also the pecker levers *l*, *l*, that drive the shuttle to and fro.

In the representation of the back of the lathe at fig. 8, it will be perceived that the reed *d*, is fixed in a frame *m*, *m*; which frame is mounted in the lathe, and held by pivots or studs *n*, *n*, bolted to the upper parts of the swords of the lathe. Upon these studs or pivots *n*, the reed, with its frame, is enabled to swing backward, but it is confined in its situation by powerful springs *o*, *o*, affixed to the back of the lathe, the ends of these springs pressing against the lower rail of the reed frame. The tension of these springs *o*, *o*, may be tempered by the adjustable staples and screws *p*, *p*.

These parts of the loom are described without intending in any way to claim them as a new invention, but merely for the purpose of leading to and more readily illustrating the design and operation of the present improvement.

The Patentee then proceeds to describe the particular features of his improvement. A perpendicular lever *q*, is attached to the side of one of the swords of the lathe by means of a fulcrum pin or stud *r*, projecting from a bracket bolted to the sword. The upper end of this lever bears against the bottom rail of the back of the reed frame *m*, and is held there by a slight spring, see fig. 3. The lower part of this lever is attached by an axle joint to a horizontal rod *s*. That end of the rod *s*, to which the lever *q*, is connected, is bent downward, as shown in fig. 2, for the purpose of enabling the rod to pass over the rocker or swinging bar or axle at bottom of the sword, which the lathe vibrates upon. The joint connecting the end of the lever *q*, and rod *s*, must be brought as nearly in coincidence with the axle of the lathe as may be found practicable.

At the back part of the loom there is a perpendicular shaft *t*, supported in brackets bolted to the side frame or standard. Upon the upper part of this shaft is fixed an endless screw or worm taking into the teeth of a wheel on the warp beam; by the rotation of which worm the beam is turned, and made to deliver the warp. A ratchet wheel *u*, is made fast by a bolt, or otherwise, to the perpendicular shaft *t*, near its lower end; and below this a cylindrical piece or collar *v*, is loosely fitted upon the shaft, and held up by a pin.

From the side of this collar *v*, a small arm extends, carrying an upright stud, which passes through an eye at the back end of the horizontal rod *s*, for the purpose of forming a jointed support to that end of the rod. At a short distance from this joint, a standard *w*, is fixed into the horizontal rod, carrying a click or tooth, the point of which drops into the teeth of the ratchet wheel. This tooth is the driver that gives rotary movement to the ratchet wheel and shaft *n*, and *t*.

A bent arm *x*, is affixed by bolts to the horizontal rod *s*, the elevated end of which arm being struck by the sword when the lathe falls back, gives a sliding movement to the rod *s*, and thereby causes the click *w*, to drive the ratchet wheel *u*.

Below the endless screw or worm on the perpendicular shaft *t*, another ratchet wheel *y*, is fixed, corresponding in the number of its teeth with the ratchet wheel *u*. This ratchet wheel *y*, acts upon a tooth at the end of the shorter arm of a bent lever *z*, *z*, suspended on a pivot or stud in a bracket attached to the side frame. At the reverse end, that is, near the extremity of the longer arm of this bent lever *z*, a tappet pin is fixed, for the purpose of raising the arm of the ordinary taking up lever, which works the click or driver of the ratchet connected with the ordinary train of toothed gear, for taking up or winding the cloth upon the beam in front, as usual.

The Patentee having described the construction and adaptation of his improved machinery, proceeds to show the manner in which it operates. After every flight of the shuttle through the open shed or warp, the lathe advances toward the work beam, for the purpose of causing the reed to beat up the weft thread; but as the reed *d*, is mounted in a vibrating frame *m*, the force with which it strikes against the cloth or filling causes the lower rail of the reed frame *m*, to recede or swing back from the lathe a short distance, as shown in the section fig. 2.

As the upper end of the perpendicular lever *q*, bears against the lower rail of the reed frame whenever the reed frame recedes, as above described, that end of the perpendicular lever is necessarily forced back, and the lower end of the lever consequently moved forward, bringing with it the horizontal rod *s*. This movement of the horizontal rod *s*, causes the end of the bent arm *x*, to be brought close against the vibrating sword of the lathe, and also draws back the click *w*, over one tooth in the ratchet wheel *u*. On the return of the lathe into the inclined position, as shown by dots in fig. 2, the sword will strike against the end of the bent arm *x*, and slide the horizontal rod *s*, back again, which will cause the click *w*, to drive the ratchet wheel *u*, one tooth, and thereby turn the shaft *t*, and its endless screw, by means of which the warp beam is drawn round, and the warp given out.

But in the event of the warp thread having broken, there will be no delivery from the shuttle, and consequently a want of filling to the cloth; the reed, therefore, in beating up, will not meet with that resistance which it did when the filling of the weft thread was perfect. In the beating up of the lathe, therefore, the reed frame will not now be driven back as before, nor the lever *q*, be sufficiently acted upon to cause it to slide the horizontal rod *s*, through the same distance: consequently, the click *w*, will not be drawn over another tooth of the ratchet wheel *u*; and the shaft *t*, being thus allowed to remain in a quiescent state, the warp will no longer be given out from its beam.

The rotary movement given to the perpendicular shaft *t*, in the way described, carries round the ratchet wheel *y*; and the teeth of this ratchet wheel acting upon the tooth at the end of the shorter arm of the bent lever *z*, causes that end of the bent lever to be depressed every time that a tooth of the wheel *y*, passes over the tooth of the lever, as shown by dots in fig. 2.

By these means, the reverse end or longer arm of the said lever is raised, which causes the tappet pin fixed near its extremity to lift the take-up lever, which operates upon the ordinary gearing for winding or taking up the cloth on the work beam, as usual. But when the rotary movement of the perpendicular shaft *t*, is suspended, owing to the breaking of the weft thread in the way described, then the taking up of the cloth ceases, as well as the delivery of the warp, although the general evolution of the loom continue in action.

When it is desired to weave a cloth or other fabric of very light texture, it will be necessary to take off the pressure of the lathe, and the force of the springs *o, o*, by the introduction of a loose bolt passed horizontally through a hole near each end of the lathe, as shown at *, in fig. 5; the front ends of which bolts, as the lathes come forward, strike against the breast beam or the frame of the loom, and their back ends against the inner parts of the springs *o, o*. By this contrivance, the Patentee says he is enabled to beat up the weft by the weight or pressure of the pendant reed alone.

Having described my improvement in looms, and shown, by the accompanying drawings and foregoing description, the best mode of constructing and adapting the same that I am acquainted with, I desire to be understood that I do not intend to confine myself to that particular form and arrangement of the parts, shown in the drawings, by which I effect my improvements in looms, as different forms and arrangements of mechanism may be found capable of effecting the same objects; and, indeed, the various constructions of looms in common use will necessarily require different modifications of mechanism, for the purpose of bringing the principles of my improvement into operation; but that which I claim as the particular feature of my improvement, is a mode of connecting and communicating the receding movement or action of a vibratory reed with the mechanism by which the warp is given out and the cloth taken up. In order that the operations of delivering the yarn from the warp beam, and drawing forward or winding up the cloth by the work beam, may be dependant upon, resulting from, and regulated by the action of a vibratory reed; and which operations shall continue as long as the weft thread or filling is supplied, but cease immediately on that supply being suspended.—[*Inrolled in the Inrolment Office, April,* 1835.]

Specification drawn by Messrs. Newton and Berry.

To MATTHEW BUSH, *of Dalmonarch, Print-field, near Bonhill, by Dumbarton, North Britain, calico printer, for his invention of certain improvements in machinery or apparatus for printing calicoes and other fabrics.*—[Sealed 24th May, 1830.]

THE subjects of this patent are designed as additions to and improvements upon the machinery described under several previous patents obtained by the present inventor, relating to calico printing. They apply to certain novel means of facilitating the operations of printing by blocks, in conjunction with cylinder or plate-printing, for the purpose of filling up the minor and more delicate parts of a pattern to be printed in divers colours upon the calico or other fabric.

Referring to the specification of his former patent of the 27th of March, 1827 (see the London Journal of Arts, Second Series, vol. vi. p. 16), the Patentee states that he there, among other things, described a mode of distending, by means of lateral tension rails, the calico or other goods evenly over a flat table, to be printed by blocks in the minor parts of its pattern, after it had been partially printed in a roller or plate-press; but that these contrivances have, owing to the shrinking of the goods in dying, been found insufficient for bringing the successive portions of the pattern so exactly into the same places upon the table, as to enable the impressions of the filling-up block to be made accurately, to register or coincide with the parts of the pattern previously printed.

This defect in the former machinery, is now proposed to be remedied by the employment of moveable pieces or fingers acting upon the face of the fabrics, which are to be connected to compound levers, mounted on studs under the table, and worked by the hands of the operator, for the purpose of pressing upon and slightly distending particular portions of the fabric when spread out upon the table, in order to correct any little inaccuracy of position arising from the partial shrinking of the calico or other fabric.

The mechanism appears to be considerably complicated, and is so very elaborately set out in the drawings and descriptions, as to render any tolerable exhibition of its form and mode of operating perfectly impracticable within the limits of our Journal. We must, therefore, beg our readers, in the present instance, to be content with a general description of this invention and its objects.

These fingers are wedge-formed, and applied in pairs; so that on moving such of the levers to which each pair severally belongs, certain pairs of fingers will be brought down upon the fabric, and expand simultaneously, by stretching out parts of it upon the flat table in such directions as may be required to bring any particular portion of the previously printed outline of the pattern into the proper position, for coinciding or registering accurately with the printing blocks about to be applied.

The second feature of the invention, is a mode of adapting to a small cylindrical machine, for printing calicoes and other fabrics, the above-described fingers, for correcting the register in connexion with certain small auxiliary rollers for printing portions of the pattern in distinct colours. This part of the invention applies to the machinery for printing calicoes, described in a former patent obtained by the present inventor, dated 7th October, 1824 (see London Journal of Arts, First Series, vol. xi. p. 337).

The fabric being distended upon a flat table, and the fingers applied to correct the position of the parts as described, the auxiliary printing roller, mounted upon an axle in framework, is made to travel over a certain part of the face of the fabric, by means of a rack and pinion. The auxiliary roller has immediately over it, and in connexion with its surface, an angular trough or box, containing colour, with scrapers for preventing the delivery of a superfluous quantity, much in the way of ordinary printing cylinders.

These auxiliary printing rollers are, by the force of certain levers, brought down into contact with the surface of the fabric to be printed, and are conducted over certain parts of the fabric by the action of the rack and pinion, other parts of the fabric being guarded by strips of oil-skin; and when the required portions of the pattern have been filled up by this auxiliary roller, it is raised up from the face of the fabric, and returned to its former position.

The third feature of the present improvement applies to former patents for printing calicoes, granted in January, 1813, and July, 1820 (see London Journal of Arts, First Series, vol. ii. p. 424). In these previous inventions, flat blocks for printing were to be employed, in conjunction with copper-plates or printing cylinders, by the adaptation of a flat bed or platform behind the cylinder and blanket. In the present instance, several flat beds or platforms are to be employed, one behind another, in succession, for the purpose of printing the various parts of the pattern severally upon the different platforms, as the fabric is conducted forward through the machinery; which operations are performed by a rank of boys on elevated seats.

This arrangement of the machinery, with the rank of boys mounted aloft, has rather a ludicrous appearance. The fabric is distended over rollers as usual, and is passed through the printing press, guided by an endless felt or blanket; by the operation of which machinery the fabric receives the groundwork of the pattern. Behind the press, the series of platforms or beds are fixed at certain distances apart; over the surface of every one of which beds the fabric passes, conducted by an additional or auxiliary blanket. The boys are all mounted upon elevated seats, as on horseback, in a rank above the platforms, having their feet wide apart, bearing upon rests, and their legs astride across the fabric, which is conducted along under them.

Each of the boys holds a printing block, designed to form a distinct portion of the entire pattern; to which block he applies the required colour, and then lays it down upon the fabric to give the impression. The operations of all the boys are to be performed simultaneously, like a rank of soldiers exercising; that is to say, they all ink or colour their blocks at the same time, and all apply them to the fabric at the same moment. The portion of the pattern produced by the first boy, when the fabric has advanced, receives the addition of another colour from the second; which is further added to when the fabric has advanced again by the third boy, and so on, until all the parts of the pattern are, by the successive operations, filled up. The number of boys to be thus employed in applying the blocks, must depend upon the number of portions or colours required for composing the whole design.

The mode of applying the blocks severally, is nearly the same as in the ordinary process of block printing; the part of the fabric to be operated upon being evenly distended upon a flat bed, the surface of the block is coloured, as usual, by hand, and is then carefully placed by the operator upon the particular part of the fabric fitting or registering exactly with the other parts of the pattern. To give the impression of the block fully to the fabric, it is necessary that the operator should strike upon its back with a mallet or hammer; and this is done, in the present improved apparatus, by a hammer appended by a joint to the seat of each boy.

As the fabric to be printed passes under the seats of the operating boys, they must necessarily stoop down below their seats in placing the blocks upon the face of the fabric; and therefore a rest is required to be attached to each seat, against which each boy may support himself in the act of stooping. This rest is formed by the hammer or mallet, which is connected by a hinge joint to the front of the seat; when the boy stoops to place the block, his breast bears upon the mallet; but when the block has been so placed, the boy rises on to his seat, and lets fall the mallet upon the block, which effects the impression.

The points particularly claimed under this patent as new, are stated under four heads:—first, the levers, rods, fingers, and other parts of the machinery for stretching portions of the fabric; second, the combination of the small auxiliary printing rollers, with a press or machine worked by a small cylindrical roller; third, the additional or auxiliary blanket employed in the machine or apparatus where many colours are to be introduced, by a series of blocks; and, fourth, the jointed hammers or knockers for supporting the boys while placing the blocks, and by which they strike the blocks when placed.—[*Inrolled in the Inrolment Office, November,* 1830.]

To CHARLES SCHAFHAUTL, *late of Munich, but now of Cannon-street, in the city of London, gentleman, for his invention of an improvement in the mode of manufacturing malleable iron.*—[Sealed 13th May, 1835.]

THE subject of this patent is a discovery in chemistry, by which, it is said, a very important improvement in the manufacture of iron may be effected, and a quality obtained from ordinary British iron equal to the best specimens of Swedish. The Patentee applies his chemical materials to the iron when in a state of fusion in the puddling furnace; and the effect is, that he there gets rid of the natural impurities of the iron principally by evaporation. The following is the process which he describes in his specification.

To produce soft iron take these proportions:—Of the black oxide of manganese, clean and free from foreign matters, one pound and three quarters; of common salt, well dried, three pounds and three quarters; of potter's clay, well washed and purified, as when prepared for making earthenware, and also properly dry, about ten ounces. These ingredients must be reduced to fine powder, and perfectly mixed up together; which may be conveniently done in a machine, such as is commonly employed for grinding colours.

The chemical ingredients having been thus prepared and mixed, the usual weight of three hundred and three-quarters of pig metal may be placed in the boiling oven in the ordinary way; and when fluxed, the valve or lid of the chimney should be lowered, in order to cause the flames to pass over the surface of the metal in clear transparent streams, so that the surface of the fused metal may be seen during the whole process.

The flap on the chimney should never be lowered so much as to allow the flames to become of a dark, yellow, cloudy appearance, so as to obscure the surface of the metal; for this would indicate that the process was going on too rapidly, and would cause the iron to become imperfect; but as soon as at any time dark yellowish flames fill the furnace, more vent must be given; which may be done by partially opening the stoke-hole, and thereby admitting fresh air.

From three to five minutes after the fusion of the mass of iron (which depends on the slower or quicker working of the fire) the chemical ingredients should be introduced, and which are recommended to be kept near the oven, in a warm and dry atmosphere. The chemical ingredients should be put into the oven in about twelve portions, at intervals of about one or two minutes between each charge, in quantities of about half a pound each time. A cylindrical shovel, capable of holding about half a pound of the mixture, will be found convenient for this purpose.

As soon as the first portion is introduced through the stirring hole, it must be mixed with the mass as quickly as possible: by this means the whole mass becomes more liquid, and it begins to emit pale yellowish flames on its surface. After an interval of about one or two minutes, the second portion should be introduced, and so on.

After the introduction of the third or fourth portion, the mass is in such a state of foam, and so swollen from the evolving gases, as nearly to reach the stirring hole. At this time the iron begins to disengage itself from the impure matters, and to precipitate to the bottom of the oven, when the greatest attention is required. The flames emitted by the boiling mass at that period become more vivid and clear, exhibiting at their extremities streams of fine light blue colour, reaching about five or six inches high.

The precise intervals for introducing the portions, are best ascertained by observing when the flames decrease in volume on the surface; which decrease shows that the former portions cease to have further effect, and then the next portion must be put in; but it is always important to be attentive, that the mass does not become thick too soon; and if this appears, a shovel-full of the mixture must be thrown in quickly, and even a second, which will render the mass liquid again.

The surest sign that a sufficient quantity of the mixture has been applied, is, the blue flames continuing to the time when the iron is ready to be worked up into balls.

It should be the object of the operator to preserve, as nearly as can be done, a constant equality in the quantity, number, and brilliancy of the flames during the whole operation. The time which the process occupies, if properly attended to, from the introduction of the first portion to the introduction of the last, is about half an hour; and it is a sign of a correct application of the ingredients, if, during the introduction of the last, or the last but one portion, the workman stirs up from the bottom crumbling malleable iron; but this appearance ought not to be perceptible sooner, as it would indicate that the oven worked too quickly, or that the valve was lowered too much.

It is essential, for obtaining a good uniform quality of iron, that a strong, equal, and quick working with the stirring tool should be continually kept up; and after the last portion of the chemical mixture has been put in and stirred for two or three minutes, the oven may be discharged, and the metal treated in the usual manner.

If a harder iron for conversion into steel is required, the Patentee employs three or four shovels-full of the slack that is yielded in rolling the iron, and is found under the rollers, and three shovels-full of the cinders that runs out of the balling furnaces; and in the mixture he puts only half the proportion of manganese before mentioned. Under this process the blue flames do not show themselves until about the eleventh or twelfth shovel-full, and it is only then the mass begins to form.

Or if it is wished to obtain a still harder iron, the usual quantity of hammer-slacks being applied, add a shovel-full of the cinders from the balling furnace, and compound the mixture of manganese, salt, and clay, in the proportions above stated.

For steel, it is proposed to apply as much as fifteen shovels-full of this mixture successively, and more rapidly; and when the mass is becoming thick, add about twelve shovels-full at intervals of one, or one and a half minutes, or as many as can be put in, until the iron is ready for balling.

The Patentee says, lastly, I claim as my invention the introduction, in the manner aforesaid, of the ingredients, hereinbefore mentioned, into the metal, when in that state which is commonly called a boiling state, whereby I am enabled to obtain a better flux for the operation, and more effectually to purify the metal than heretofore.—[*Inrolled in the Inrolment Office, November,* 1835.]

To ROBERT WOLF, *of Cornhill, in the city of London, musical instrument-maker, for an improvement in piano-fortes, consisting in the new construction, on the principle of acoustics, of a sounding body, applicable to every description of piano-fortes.*—[Sealed 2d March, 1835.]

THIS invention is stated to consist in substituting a hollow receptacle or shell of a curvilinear shape, which is called a sounding body, in lieu of the usual sounding board in piano-fortes.

The precise shape of the sounding body is not material, provided the sides be curvilinear, or limited by curved lines, and may be made in any of the shapes shown by the drawings annexed (see Plate XIV.); but it is considered that the shapes represented by figs. 13 and 14, are better than the funnel-shape, the hemisphere, or the ellipse, or longitudinal section of an egg, shown in the drawings figs. 6, 8, and 10, and their respective sections or profiles 7, 9, and 11.

The upper part of these several sounding bodies are called the sounding boards, in which a sounding hole must be made; but in the forms shown by figs. 13 and 14, at least three sounding holes had better be made, as shown by the ovals in these figures; but the sounding holes, shown by the dotted lines, may be made either in the sounding board or in the bottom of the sounding body.

The bodies or shelves in the cone or funnel-shape, and also in the hemispherical shape, and the elliptic or longitudinal section of an egg-shape, are to be made of veneers of maple wood, sycamore wood, or hard wood, or any other wood of a similar nature, such as is generally used for the bodies of guitars, violins, or other similar musical instruments; which veneers should not exceed in thickness one-tenth of an inch, and should be cut into triangular pieces for the cone-shape, and into ribs or gores for the other two shapes, similar to the pieces of silk or other substances forming an air-balloon, and as shown by the dotted lines in figs. 7, 9, and 11, so as when put together they will form the shape required, and the edges to be carefully glued together upon a block or mould of wood of the required size and shape, after which they are to be neatly cleaned off and made smooth.

The sounding bodies in the forms shown by figs. 13 and 14, are to be constructed as follows:—Make a strong mould or frame of wood, on the plan of the mould used by guitar-makers, but in the shape of the sides of the sounding body to be made, in which the sides of the sounding body are to be framed or curved by bending; these sides being first cut as nearly as can be to the required shape, and afterwards planed down in the mould to the precise form.

When found necessary, the bending may be assisted by the application of steam or warm water, after the well-known manner in use among the makers of guitars and violins. The sides to be made of veneers of maple, sycamore, or hard wood, or other similar wood, as before mentioned, of a thickness not exceeding one-tenth of an inch, and of as few pieces as possible: a small strip of wood, similar to the lining used in violins, is then to be glued round the inside of the sides of the sounding body, level with their upper surface; and also a similar strip of wood round the inside of the sides, level with their lower surface, not only to strengthen the sides, and hold them in form, but also to hold more firmly the bottom, and also the top or sounding board to be glued thereon.

The bottom is to be made of the same wood as the sides, but of about the sixth of an inch thick; and the bottom, and also the top or sounding board, are then to be glued to the sides while they remain in the shape or mould, which will cause the bottom to curve to the required form, the sounding board remaining flat; and the bottom may be also (before the top or sounding board is glued on) strengthened in that shape by means of ribs of soft wood cut to the curve required, and glued across the inner surface of the bottom at intervals, as shown by the dotted lines across the figs. 13 and 14, similar to the ribs of a common sounding board for piano-fortes.

The sounding board, which is to be of the usual thickness of sounding boards for piano-fortes, is to be made of soft wood, with a straight grain (Swiss belly-wood, of which the sounding boards of piano-fortes are usually made, being preferred), and the grain of the wood should run parallel to the direction of the strings; and it should also be strengthened by ribs of soft wood, in the manner that sounding boards of piano-fortes are usually strengthened.

The body being thus constructed, it is to be attached to the piano-forte by either of the two following methods. The first method is, to glue to the inside of the sides of the sounding body a number of small blocks of wood, sufficiently large to receive and hold the worm of an iron screw or screws about an inch long. About ten or eleven of these blocks are sufficient for the sounding body; but, of course, the number will increase or decrease with the increased or diminished length of the body, the object being to hold the sounding body quite firm when the instrument is strung.

In the circular sounding body, they may be equally disposed; but in the elliptical sounding body, they are to be placed closer together at the smaller end of the body than at the larger end; and the places shown in the drawing fig. 12, are considered to be the best places for the purpose. It is necessary to secure, with one or two screws about an inch long, strong iron cramps bent in a right angle, as shown at the smaller end of fig. 13, to those parts of the outside of the side of the sounding body where the small blocks of wood are glued on the inside, and by means of another screw to fasten the iron cramp to the bracings or interior of the case, which must be constructed so as to surround the sounding body on all its sides.

The method of constructing the bracings, instead of the usual mode, is to put a strong oak board, of at least an inch and a half thick, filling the whole of the case, passing over the face of the rest plank or block, and thereby supplying the place of the usual wainscot for receiving the pins. This board is to be composed of two layers glued together, crossing the grain of the wood, and attached by glue firmly to the frame and restblock.

In this board the shape of the shell or sounding body is cut out, but rather larger than the sounding body, and so as freely to admit the same without at all touching, so that the sounding body is left perfectly free from the case-bracings or board, except where it is attached by the iron cramps; and this board is further strengthened by bracings behind, in the usual manner, where they do not interfere with the sounding body.

The second method of attaching the sounding body to the instrument, is to make the sounding board all round about an inch larger than the sounding body to which it is attached, so that it projects about an inch over the sides of the sounding body in each direction, as shown at the larger end of the drawing, fig. 13. One half of this projecting edge or flange of the sounding board is there to be glued in a rabbet round the opening made to receive the body or shell in the bracings or interior of the case, made, as before mentioned, so as to allow a space between the bracings and the sounding body sufficient to leave the latter free on all sides; which rabbet is to be sufficiently deep to give the strings a proper bearing; and in this flange, between the bracings and the sounding body, small holes may be bored, in order to prevent as much as possible the vibrations being carried over from the sounding body to the case, care being taken not to bore the holes so as to weaken the wood too much; and the only rule for which is the discretion of the workman, as the piano-fortes may be used without such holes.

The bridge is placed on the sounding board in the usual way; but the bridge may also be made in the shape shown in the drawings, figs. 8, and 10: in which case the longest or bass string must be placed in the centre or largest diameter of the sounding board, and the other strings alternately on each side the first, as they decrease in length.

In this mode of making the bridge, a cross action would be necessary; but the Patentee does not claim such mode of making the bridge as any part of the present invention, which is confined to the curvilinear sounding bodies, as already mentioned, and illustrated by the several figures in the drawings.

The size of the several sounding boards, figs. 6, 8, and 10, and, consequently, of the sounding bodies to which they are attached or form a part, will be determined by the openness of the scale, or distance between string and string, and consequent length of the bridge. It is considered that in a circular sounding board a diameter of from two feet six inches to three feet, the best; and when the sounding body is hemispherical, the depth will be one-half of the diameter. When the sounding board is an ellipse, as in fig. 10, the length is to be in proportion, so as to produce the ellipse, and the depth of the body to be in the deepest part one-half the cross diameter of the sounding board.

Fig. 13, is a profile of the sounding body, of which fig. 12, is the surface, or sounding board, and is intended for a square horizontal piano-forte. Fig. 14, is intended for an upright or for a horizontal grand piano-forte.

It is necessary that these sounding bodies should regularly decrease in depth, as well as in width, from the part where the larger or bass strings pass over to the part where the shorter or treble strings pass over, the decrease in depth always taking place in lines parallel with the strings, the depth being equal on both sides the shell or sounding body at the same string; and this decrease in depth and width is shown in figs. 14, and 15; the seven lines in figs. 12, and 14, indicating the parts where the seven strings, each producing the note F, pass, and showing the depth and width of the sounding body, according to scale of proportion. Fig. 15, gives the depth alone.

The scale of widths and depths has been determined by experiment, the object being to make the vibrations of the sounding body correspond respectively with the vibrations of the respective strings. This scale need not vary with the quality of the wood used in forming the sounding body, because a variation may be made in the thickness of the wood, after the manner now practised in making common sounding boards.

When the bridge is short, and, by consequence, rapidly curved, the width cannot in every part be made correctly according to the scale; but the scale should not be departed from more than is rendered absolutely necessary by the difficulties of construction. —[*Inrolled in the Inrolment Office, May,* 1835.]

To WILLIAM RODGERS, *of Norfolk-street, Strand, in the county of Middlesex, lieutenant in our royal navy, for a certain improvement or certain improvements in anchors.*—[Sealed 26th July, 1833.]

The Patentee commences his specification with rather an elaborate treatise on anchors, pointing out the defects both in strength and holding properties, which he has observed from practical experience in the different anchors employed in the royal navy. His present invention, he says, "relates to those parts of anchors which are usually termed the palms, and whereby a considerable saving of the iron commonly used in the formation of those parts may be effected, and it can be more beneficially applied in strengthening the shank and arms."

"It has long been known to practical seamen, that when an anchor of the usual construction with large palms is dragged through adhesive ground, it is liable to get *shod*." This forces the anchor out of the ground, and no dependance can be placed upon its again taking secure hold. To remedy this defect is the object of this invention; which applies, firstly, to the property of taking hold; and, secondly, in its greater power of resistance with a given weight of metal.

In order to avoid the defects of existing anchors, the Patentee proposes to alter the size and form of the palms. He has found from experience that not only anchors with small palms will hold better than large ones, but that the arms of the anchor, even without any palms, have been found to take more secure hold of the ground than anchors of the old construction of similar weight and length.

This, however, is exceeding the limits of alteration proposed by the Patentee; he has "fixed upon one-fifth of the length of the arm as a suitable proportion for the length or depth of the palm." The object had in view by these proportions is, "to get the extreme breadth of the palm at the greatest possible depth, so as to obtain the greatest resistance with a given surface, and to insure the most favourable angle for taking hold and retaining it."

In the construction of these improved anchors with small palms, the Patentee has altered the relative proportions between their shanks and arms. Plate XIV., figs. 16, and 17, represent one of the improved anchors in two positions, the parts being drawn in the proportions proposed by the Patentee. He says, "I may observe, that the arms of my improved anchors may be either *shut* at the crown in the usual way, or according to Mr. Perring's plan, as shown at fig. 18. Should the latter plan be followed, which I would strongly recommend where the expanse is not an object, and more particularly for large anchors, I propose to make the shank of two flat slabs, an edge view of which is given at fig. 19. These slabs are forged about two-thirds the intended length of the shank, and after being welded together, are reduced to the proper form and dimensions, and drawn out about four inches in the foot, in order to improve the quality of the iron. The ends are then to be turned up and welded to the arms, as shown at fig. 20.

The improvement herein proposed consisting simply in the employment of small palms at the ends of the arms, and in variation from the proportional dimensions of ordinary anchors, it will not be necessary to go further into the Patentee's arguments in recommendation of his improvement, but only state the precise features of novelty considered by him to form the substance of his patent right, which is expressed as follows:—

"Although I have thus enlarged upon what I believe to be the best method or manner of making anchors, yet I do not mean or intend thereby to claim as my invention any thing therein described which has heretofore been used; but I do mean or intend to claim the peculiar shape or form of the palms, the dimensions of which are greatly reduced in comparison with those in general use, together with making the arms of anchors without palms.

"And, as it has hitherto been the practice to make the palms of anchors longer or deeper than they are broad, or of equal length and breadth, I do likewise claim as my invention the method of making palms broader than they are long or deep; and as the old palms have been usually made about one-half the length of the arms, under the belief that they were more efficient than they would have been if made shorter and narrower, I do hereby also mean or intend to claim as my invention the reduction of the length of the palms in the manner above described; and as the benefits of my invention will be in some measure obtained even by a partial deviation from the ordinary proportions of palms now in use, without the adaptation of the whole of my said invention or improvement, I shall consider all such partial adaptations of my invention as imitations and invasions thereof."—[*Inrolled in the Inrolment Office, January,* 1834.]

To JOHN RAWE, *junior, of Albany-street, Regent's-Park, in the county of Middlesex, (being one of the people called Quakers,) and* JOHN BOASE, *of the same place, gentleman, for their having invented certain improvements in steam-carriages and in boilers; and a method of producing increased draft.*—[Sealed 19th July, 1830.]

THE subject of this patent is a locomotive engine and carriage to be propelled by steam. The Patentees state, in the commencement of their specification, that the invention is divisible into three distinct heads, consisting, "First, of a boiler composed of a novel arrangement of spiral pipes; second, a method of creating increased draft in such, and other boilers; third, a new apparatus for guiding the carriage; also a new mode of affixing the main or driving crank axle to the propelling wheels of a carriage, and the application of rods or stays to the crank axle, to allow the carriage to be mounted on springs; also to regulate the supply of water."

The particular features are not set out in the specification in a very clear and intelligible manner, but as far as we can understand the intention of the Patentees, there does not appear to be any prominent features of novelty beyond mere arrangement of the parts.

As respects the boiler, it is proposed to be constructed by a coil, or several coils (for we do not perceive which is intended) of small metallic pipe, winding in helical curves round the interior of a cylindrical vessel made of plate iron, which contains the furnace. This pipe or pipes, if we understand right, is supplied with water from a vessel of a conical form, situate in the interior of the furnace, the apex being downwards, and extending below the ash-pit.

The flames and heated vapours, playing around and between the coils of the pipe, cause steam to be generated within, which, passing upwards, enters a strong vessel as a steam chamber, from whence it is, we presume, to be conducted to the working cylinders, but by what means is not shown.

As water will be forced up the pipe, mixed with the steam, that portion of the water which does not return down the pipe flows into the central conical vessel, and is conducted again to the boiler by a force-pump which is always in action to supply the boiler.

The increased draft of this furnace is effected by a rotary fan within the upper part of the cylindrical vessel which encloses the furnace and boiler. This fan turns horizontally upon a vertical shaft, and is made with oblique arms for the purpose, as it is said, of forcing the air, smoke, and vapour upwards, as it revolves. The shaft of the fan extends down through the centre of the conical vessel, and has a crank or excentric wheel affixed to it at bottom, which is driven round by a crank rod from the piston of a small auxiliary steam cylinder, which also works the injecting pump.

The partial vacuum produced by the rapidly-revolving fan is intended to cause the air to pass, we suppose, from some opening below through the furnace; but how the air, smoke, and vapour is to be discharged from the close furnace, is not shown, nor any chimney to conduct it.

The apparatus for guiding the steam-carriage is a fifth wheel, placed in the middle under the carriage, at some distance behind the front wheels. This fifth wheel turns upon a sort of universal joint, and is moved in a horizontal direction by a handle and levers communicating with a vertical shaft, extended upwards to the coach-box or conductor's seat. We do not, however, perceive in what way this fifth wheel is to guide the carriage, as it does not appear to be connected to the front wheels in any way that would cause them to turn and preserve a parallelism with it.

The main driving crank axle, and the hind-wheels of the carriage, to which the propelling power is to be applied, are affixed together by some rods, arms, or stays, extending from the naves of the wheels, which are stated to be for the purpose of allowing the carriage to be mounted upon springs. There is also a contrivance for regulating the supply of water to the boiler, by means of a float swimming on the top of the water in the central conical vessel; which float, being connected in some way to the supply pipes, as the water rises or falls in the conical chamber, closes or opens a cock, and thereby regulates the quantity of water injected into the boiler at every stroke of the pump.—[*Inrolled in the Inrolment Office, January,* 1831.]

To WILLIAM PARKER, *of Albany-street, Regent's-park, in the county of Middlesex, gentleman, in consequence of a communication made to him by a foreigner residing abroad, for certain improvements in preparing animal charcoal.*—[Sealed 15th January, 1831.]

IN the preparation of sugar before it is worked up into loaves, it is the usual practice to apply charcoal for the purpose of clarifying the syrup, and depriving it of its colouring matter: for this purpose, animal charcoal is preferred; that is, the substance obtained from carbonizing bones, blood, and other animal offal.

This material, though produced from the very refuse and otherwise worthless parts of animal matter, is, nevertheless, expensive to procure, in such large quantities as are required for the purpose of clarifying sugar: it is, therefore, the object of this invention to renovate animal charcoal after it has been used for this purifying purpose; that is, to restore its chemical properties, after they have been deteriorated by their action upon the sugar.

The charcoal, when taken from the vessels in which it has been employed for the purposes of clarifying the sugar, is to be thoroughly washed with the purest water that can be obtained, in order to remove all the saccharine matter from adhering to it. When the washing process has been completed, the charcoal is laid out to dry, either in the open air or in a suitable stove, and when perfectly free from moisture, it is to be separated into small pieces, and sifted through a sieve, the wires or meshes of which are placed at distances of about two and a half in every inch. This sifting will not only divide the charcoal into small pieces, but will cause any bits of wood, or other improper matters, to be separated from it.

The charcoal thus prepared is then to be packed tightly in cylindrical vessels called crucibles, with some small quantity of bones, oil, or other animal matter mixed with it. The crucibles are then to be closed by covers, and luted at the joints, leaving no other opening but one small hole in the centre of the cover, through which any gas, generated within the vessel when placed in the oven or furnace, may be allowed to escape.

The crucibles are then to be ranged round the oven, and placed, one upon another, in vertical positions; and when the oven is properly heated, gas will be generated within each crucible, and issue out from the central hole. The gas thus emitted, being of an inflammable quality, will take fire, and assist in heating the crucibles; and the operation being carried on until the crucibles become of a red heat, the oven is then to be closed and allowed to cool; after which the crucibles are to be removed, when the charcoal will be found to have become perfectly renovated, and fit for use as before.

The Patentee claims two particular features under this patent: first, the restoration of animal charcoal, after it has been spent by its application to the clarifying of sugar, and the use of such restored charcoal for that purpose; and secondly, the mode of effecting the object by cylindrical crucibles placed erect round an oven, as described.—[*Inrolled in the Inrolment Office, May,* 1831.]

To ANDREW SMITH, *of Princes-street, Haymarket, in the county of Middlesex, engineer, for his invention of a new standing rigging for ships and vessels, and a new method of fitting and using it.*—[Sealed 12th January, 1835.]

THIS invention of a new standing rigging for ships and vessels, and a new method of fitting and using it, consists, first, in a new and improved method of constructing standing rigging, by combining any number of small metallic rods or wires; secondly, in the peculiar method of connecting the ends of such wires or rods into cylindrical pieces, answering the purpose of dead-eyes and lanyards in ordinary rigging, and a new mode of attaching them to the crosstrees and other parts of common rigging; thirdly, in the method of adjusting the tension; that is, tightening or slackening of such rigging, when required, under particular circumstances, such as change of temperature in different climates, and also when it may be required to remove it for the dismasting of a vessel, or for any other purpose; fourthly, in the means of preserving such standing rigging from the ill effects of corrosion or oxidation, by coating or varnishing it with a mixture or solution of dissolved caoutchouc (Indian rubber) and oil asphaltum, or any other anti-corrosive compositions or mixtures; and also enclosing the rods with coverings of cloth and cords, in the manner hereinafter particularly described, such coverings being also saturated or served with the water-proof composition.

The several figures in the accompanying drawings will illustrate my invention, and the manner of carrying them into effect. Plate XV., fig. 1, is a diagram respecting the elevation of a mast, with part of the deck of a vessel, in which the shrouds are shown connected with the chain plates below, and the crosstrees above; fig. 2, is a diagram on a larger scale, representing a partial side elevation and section of the upper part of the mast, with part of the crosstrees, showing the method of connecting the shrouds to a metal plate placed upon the bolster; fig. 3, is a plan or horizontal view of the same, the mast being cut in transverse section.

Fig. 4, is a diagram, representing in vertical section part of the side of a vessel with the chain plate, in which will be seen the method of connecting the shrouds thereto, and also of adjusting the tension of the shrouds, and of slackening them for the purpose of removal, in order to dismast the vessel. Fig. 5, is a section taken vertically through one of the connecting pieces of the shrouds, and through the chain plate, in order to exhibit the interior.

Fig. 6, is a partial side elevation, and fig. 7, a transverse section, on an enlarged scale, of one of the shrouds designed for the purpose of illustrating the method of preserving them from corrosion or oxidation; the same letters of reference being marked upon corresponding parts in all the figures: A, is the mast; B, the deck;

C, C, the sides of the vessel, shown in section; D, D, the chain plates; E, E, the crosstrees; F, F, the shrouds, made of rods of metal or wires, as above described; G, is a metal plate, resting upon the crosstrees and bolsters; H, H, are the tubes in place of the dead-eyes and lanyards, connecting the shrouds to the chain plates, corresponding with the ordinary common rigging; I, I, are nuts or collars with countersunk holes in them, one of which is shown detached, in plan and section, at fig. 8.

In constructing the metallic shrouds or stays, the Patentee proposes, first, to take a proper number of metal rods or wires of equal lengths, and then heat one of their ends in a furnace to a white or welding heat; these ends are then to be passed through the holes in the collars or nuts I, I, and afterwards to be beaten in or upset in their ends with a hammer, in order to fill the countersunk or conical recess in the collar, as shown in the drawings, which, fitting into the countersunk hole, will prevent the rods or wires being drawn through. If desired, the ends of the wires or rods may be upset in a proper-shaped countersunk tool or die, previous to being placed in the collar.

After having attached the ends of the shrouds to the collars, as described, the shrouds are severally passed into the grooves or notches K, K, in the plate G, as shown more particularly in fig. 3, and secured in their places by the bars L, L, which are firmly bolted on to the plate G, by screw nuts; the other end of the shrouds are connected to the tubes H, H, in the following manner:—

The pieces H, H, are made hollow, with a countersunk end, as shown more particularly in the section, fig. 5; and after the upper ends of the wires or rods have been connected, as before stated, the lower ends of the wires or rods are to be heated and passed into the tubes H, H, and upset or enlarged into the conical recess at the end of the tube, by means of a punch or tool, so as to form an enlarged or conical end to the shroud, and prevent their being drawn out of the tube.

These connecting tubular pieces H, are passed through holes in the chain plates D, having screws formed upon their outer surfaces, and they are secured by nuts M, M, at the under side of the chain plate, as shown in figs. 4 and 5. By these means, when the shroud requires to be tightened or slackened, that can be done by turning round the nut M.

When the standing shrouds require to be removed, the nuts M, M, must be taken off the lower ends of the tubes, and also the bars or pieces L, L, from the plate at top, when the shrouds can be taken away. It will be perceived, that by this method of connecting of the shrouds, or other standing rigging, by means of countersunk holes and conical enlargements, that a direct strain or tension is obtained in one right line from end to end of the shrouds and stays, no part being bent or twisted to form the attachment.

The ends of the shrouds may be connected to the pieces H, H, in the manner shown in the partial sections figs. 9, and 10. In fig. 9, the end of the shroud is first fixed in the way before described in a countersunk collar N, and then the collar and shroud are passed into the tube H. In fig. 10, the countersunk is formed at the lower end of the tube H, instead of the upper end.

Instead of heating and welding the ends of the wires into the conical holes in the tubes or collars, as described, they may be inserted into the hollow of the tubes or collars H, in a cold state. The ends of the wires being then spread out into the conical recess, melted solder may be introduced into the hollow amongst the ends of the wires so as to fill up the interstices between, which, when cold, will hold the shrouds fast in the recesses; it of course being understood that the ends of the rods or wires are first tinned in the usual way; but the former method is to be preferred, as it is more secure.

If it should be thought desirable to provide against the necessity of cutting away the masts of the ship or vessel in case of storm or shipwreck, the shrouds must be connected to the parts answering to the dead-eyes of the ordinary rigging in such a manner that they may, in case of emergency, be easily disengaged: this may be done in various ways and by various kinds of connexions.

There is shown in fig. 11, a side view of one method of connecting the shrouds to the parts answering to the dead-eyes of the ordinary rigging. Fig. 12, is a vertical section of the same. Fig. 13, is a plan or horizontal view; and fig. 14, a transverse section, taken in the line *a*, *b*, in fig. 11. The parts H, corresponding to the screwed part of the tube in fig. 4, is formed with a hollow cylindrical cup O, at its upper end, into which the collar N, and confined end of the shroud is inserted. This collar is retained in its situation by keys or fidding pieces P, P, which are placed in notches or recesses formed or cut out of the sides of the cup O.

The tension of the shroud draws the collar N, upwards against the keys P, P, and the keys are retained by the upper parts Q, of the cylindrical cup. The ends of the keys are confined for further security by links R, R.

In order to disconnect the parts, it is only necessary to knock away with a hatchet or crowbar the links R, R, then force off the keys P, P, sideways out of the notches in the cup, when the shroud and collar N, is immediately free to slip out of the cup O, and be disconnected from the holder H. It will, of course, be understood, that these connexions should be placed just above the bulwark of the vessel, in order that they may be easily got at by the men on deck.

It has been before said, that in order to preserve the rods or wires from corrosion or oxidation, they are to be coated or varnished with a solution of Indian rubber, oil, and asphaltum, or some other anti-corrosive compositions; and that the whole combination of wires required for one shroud or stay are to be bound round with cloth or cordage previously saturated with the solution before stated.

Figs. 6, and 7, *a, a,* are intended to represent the wires or rods of which the shrouds are composed; *b, b,* the coating or covering of cloth, saturated with Indian rubber, or other preserving mixture; *c, c,* is the coating of cord, also saturated with the preserving composition.

In conclusion, the Patentee says, "Having now described my invention, I wish it to be understood that I claim the construction of standing rigging, for ships or other vessels, of combined metallic rods or wires; also the manner or method of fitting and using them in the way above described.—[*Inrolled in the Inrolment Office, July,* 1835.]

Specification drawn by Messrs. Newton and Berry.

To THOMAS HANCOCK, *of Goswell-mews, Goswell-street-road, in the county of Middlesex, water-proof cloth manufacturer, for his invention of an improvement or improvements in air-beds, cushions, and other articles manufactured from caoutchouc, or Indian rubber, or of cloth or other flexible material, coated or lined with caoutchouc, or Indian rubber.*—[Sealed 4th June, 1835.]

THE Patentee describes this invention as consisting in an application of strips of Indian rubber, or caoutchouc, to cloth or other materials, of which the said air-beds, cushions, or other articles intended to be inflated with air, are made, so as to contract or gather up the cloth, Indian rubber, or other materials, in order to cause or increase elasticity therein; and the manner in which the same invention is to be performed is as follows:—

If the material to be used in making the said air-beds, cushions, or other articles, be Indian rubber only, a flat piece of Indian rubber should be obtained, sufficient to form one side, or half of the article. For this purpose, Indian rubber in sheets may be conveniently used, such as are sold in the shops; and if the sheets are not sufficiently large, two or more sheets may be joined by the well-known process of cutting their edges straight, and, after making them quite warm, bringing the edges into contact, and pressing them together. The piece or sheet of Indian rubber should be then laid upon a flat board or surface, of somewhat larger dimensions than the sheet of Indian rubber itself; some of the best Indian rubber should then be procured, and that known by the name of bottle Indian rubber, being of good quality, will answer the purpose.

This should be cut into thin strips, which may be called contractile strips.

For cushions, and other articles requiring a similar elasticity, the strips may be one-sixteenth of an inch thick, and three-eighths of an inch wide; and for beds and articles requiring a similar elasticity, one-quarter of an inch thick, and half an inch wide. The particular dimensions of these strips are not essential. If the thickness be increased, and the width diminished in the same proportion, the effect will be nearly the same; and by diminishing the sum of the dimensions, the force of the contraction will be diminished; and by increasing the dimensions, it will be increased.

These strips should then be heated to a temperature of from one hundred and fifty to two hundred degrees, by which means they become less liable to crack or break when extended or stretched; this may be easily accomplished by putting the strips into water heated to that temperature. This temperature is not essential, as the effect may be accomplished, but not so well, without the high temperature mentioned. The strips, when dry, and cut of the proper length, should be extended or stretched almost as much as they can bear without breaking, and should be laid across the flat piece or sheet of Indian rubber, and fastened in their state of extension, which may be easily effected by a nail or tack driven through each end, carried beyond the flat piece or sheet of Indian rubber, and the upper surface of the board, into the sides or edges, or to the underside of the board on which it may be placed.

The number of contractile strips must vary according to the elasticity or contraction required for cushions and articles requiring similar elasticity; the strips may be placed from three to four inches apart; and for beds and articles requiring similar elasticity, from six to eight inches apart, and for other articles in proportion. The distance and arrangement of the strips may be varied as the manufacturer shall choose to vary, or increase, or diminish their contractile effect.

The contractile strips being thus placed upon the said flat piece or sheet of Indian rubber, they should be pressed down upon it with a moderate force, until they become united to it, which will be effected in a short period. The piece or sheet of Indian rubber must then be coated with thin glue size and whitening, leaving uncoated for cushions and similar articles about half an inch round the edge, and half an inch across where each strip is placed; and of which half inch the strip will be better in the middle, except that, across or over each strip, one or more spaces or lines of about an inch broad must be coated with the whitening, so as to form a coated or protected communication from space to space between each strip.

For beds and similar articles, the space uncoated may be an inch broad instead of half an inch. To complete the article, another piece or sheet of Indian rubber, similar to the first, should be prepared in the same manner, with the same number of strips placed in the same relative situations, and coated in the same manner.

The two pieces or sheets of Indian rubber, while remaining upon the boards, must be placed one upon the other, accurately bringing into contact the coated and increased parts respectively of each sheet, and the whole submitted to moderate pressure by weights, or otherwise.

After remaining about an hour, the parts which were uncoated will have become united, and those parts should be further well rubbed down with the hand. The parts which were coated will remain disunited, and form receptacles for the air. The article may then be taken from the board, and the ends of the strips cut off. If the Indian rubber used is not perfectly clean, or has been long exposed to the air, or from any other cause does not readily unite, the parts upon which the contractile strips are to be laid, and all the parts intended to be united, should be coated with a solution of Indian rubber, taking care that such coatings are nearly dry before the parts are brought into contact.

Instead of thin glue size and whitening, other similar preparations may be used, or the spaces intended to remain disunited may be lined with cloth, or thin kid, or other similar leather, such lining being made to adhere to the Indian rubber by coating it with a varnish or cement, formed of a solution of Indian rubber, and applied when the coating is nearly dry. Articles lined in this manner will be much stronger, but their flexibility will be lessened.

In some cases, where greater care is intended, free admission of air throughout the whole cushion, or other article, may be insured by keeping open the passages across the contractile strips by a tube formed of coiled wire, and covered with sheet Indian rubber, put into the said passages.

For some articles, such as pillows, where it is not necessary or advantageous that the two opposite sides should be united, except at the edges, the whole pieces or sheets, except the edges, should be coated with the whitening, or other preparation, when upon the boards, before the pressure to unite the edges is applied.

If it be intended that the article should remain permanently inflated, a small taper tube of metal may be introduced into or through any part of the edges intended to be joined, and air forced in by the mouth, or any other convenient means; and when filled sufficiently the tube may be withdrawn, and the opening left by the tube quickly closed by pressure. Great care must be taken to prevent wetting the opening, or, if the article is intended to be occasionally inflated, a small cock may be fastened into the united edges, by covering the part to be inserted with sheet Indian rubber, bound tightly round it, and introducing it either at the time the union of the edge is effected, or a slip of stiff paper may be laid to prevent the union until the other parts are finished, and the slip of paper then withdrawn, and the cock, prepared as before directed, inserted. In order to facilitate the introduction of the said cock, and more effectually insure its perfect junction to the side of the aperture into which it is inserted, the surface of that part of the said cock which is to enter the said aperture should be coated with a solution of Indian rubber, and the cock introduced whilst the solution yet remains in the moist state, or previously to its becoming dry.

In an hour or two after this operation, or when the said solution becomes dry, care must be taken to make the junction secure by pressure all round the inserted parts of the said cock.

The article being completely manufactured, except as to this last operation, must be exposed for some time to moderate heat; and the placing or holding it near a fire will produce the desired effect, when the strips of Indian rubber, which will have been previously in an extended state, will exert their contractile force, and gradually contract or gather up the sheet of Indian rubber, and give the intended elasticity.

Instead of the sheet or flat piece of Indian rubber, the patent Indian rubber cloth or leather, or any other flexible material coated or lined with Indian rubber, may be used. In such cases, the solution of Indian rubber may be used as a cement, where the parts are intended to be united in the same manner as is hereinbefore directed, when the Indian rubber sheet has been long exposed to the air: cushions, or other articles, may be made exactly in the form and manner in which they are now made with the patent Indian rubber cloth or leather, only first applying the contractile strips of Indian rubber to the inside or unvarnished side of the Indian rubber cloth or leather, in the manner hereinbefore described; and when the said cushions or beds are completed, applying the same to the fire, or a moderately high temperature, to produce the contractile action of the strips, in manner hereinbefore described.

Contractile strips of Indian rubber may also be applied to articles already made of patent Indian rubber cloth or leather, or other flexible material lined or coated with Indian rubber. For this purpose, the article should be coated with the solution of Indian rubber, where the contractile strips and the ribbon or tape, hereinafter mentioned, are intended to be applied; and the contractile strips may then be laid across the outside of the said article, in the same manner as across the sheets of Indian rubber, hereinbefore described; and the contractile strips should be covered with ribbon or tape, which may be made to adhere by means of the cement of dissolved Indian rubber, and then the contractile force of the Indian rubber may be excited by the fire or heat, in manner hereinbefore described.

The solution of Indian rubber is well known, and may be made for the purposes hereinbefore mentioned, by cutting sheet Indian rubber into shreds, and putting it into essential oil of turpentine, in the proportion of about eighteen or twenty ounces of the Indian rubber to one gallon of the oil of turpentine, and stirring it occasionally for one or two days, when it is fit for use.

The benefit of this patent is not claimed to extend to the manufacturer of the solution of Indian rubber, nor to the method of inflating articles with air by means of tubes or cocks, as hereinbefore described; but it is claimed only to extend to the use or application of strips of Indian rubber to air-beds, air-cushions, and other articles to be inflated with air, manufactured from caoutchouc, or Indian rubber, or of cloth, or other flexible materials coated or lined with Indian rubber, in order to produce contraction, in the manner hereinbefore described; and for this purpose, the said use or application is not intended to be limited to the specific dimensions, distances, or directions of the said contractile stripes; these may be varied to a considerable extent, at the pleasure of the manufacturer.—[*Inrolled in the Petty Bag Office, December*, 1835.]

To JAMES COUCH, *of Stoke Devonport, captain in the royal navy, for his invention of certain improvements in ship's channels.*—[Sealed 25th November, 1834.]

A ship's channels are the horizontal plates or timbers projecting on the sides of a ship, for the purpose of attaching what are called the chain plates, to which the standing rigging is made fast. The Patentee has found, by his experience in nautical affairs, that, in the event of a heavy sea, the ordinary construction of channels have been liable to be forced or blown up by the wave striking under the channel plates in the angle between them and the ship's side; and also that, in the event of the mast being carried overboard, great inconvenience has resulted from not being able to disengage the rigging from the channels.

To remedy this inconvenience, it is proposed to fill up the angular space under the channels with bevel-shaped timbers, which will, if struck by the wave, cause it to glide away without injury to the channels; and also that, by some improvements in the means of attaching, the latter inconvenience may be overcome.

Plate XV., fig. 15, represents a small portion of the side of a ship: *a*, are the ship's channels, built solid to the ship's side; *b*, are the ordinary chain plates, which are let into and made flush with the ship's channels. Extra plates are applied at *c*, to give additional security; and these plates are fastened to the ship's side by the bolts *d*; the chain plates are also further secured by bolts *e*, to the ship's side just beneath the eyes to which the straps of the dead-eyes are attached.

The Patentee says, "It will be evident that, in the event of the mast being carried over the ship's side, the strap of the dead-eye would either break or the lanyard might be readily got at and cut away, which cannot be done when the bolt *e*, does not pass through the chain plate, so as to retain it securely to the ship's side, and hold the dead-eyes in a position convenient to be reached. It will also be evident that, by making the ship's channels solid, the contact of vessels will be of less consequence, as they will operate as fenders, and by affixing the chain plate, together with the solid channel, by the bolt *e*, to the side of the ship, greater security will be given; as, in the event of the ship being struck by a heavy sea, the channels will not, as heretofore, be liable to be blown up, but the waves will glide up, and pass off the side without doing any injury.—[*Inrolled in the Inrolment Office, May*, 1835.]

OPERATION OF THE NEW LAWS ON PATENTS.

Proceedings before the Attorney or Solicitor-General for disclaiming or altering a part of the title of a Patent, or of the Specification, under the first Clauses of the Act.

THE person applying must present a petition to the Attorney or Solicitor-General, stating what the proposed disclaimer or alteration is, when a time will be appointed for hearing the applicant. The petition is in general to be accompanied by a copy of the original specification, and of the proposed disclaimer or alteration.

If, on the hearing, the Attorney or Solicitor-General should think fit to disallow the proposed alteration or disclaimer, no further proceeding is necessary. If he should think fit to allow it without any advertisement, then, on being applied to for the purpose, he will put his signature to the fiat, authorising the clerk of the patents to make the required inrolment. If it appears to the Attorney or Solicitor-General that an advertisement or advertisements ought to be inserted, then he will give such directions as he may think fit relative thereto, and will fix any time not sooner than ten days from the first publication of any such advertisement, for resuming the consideration of the matter.

Caveats may be lodged at any time before the actual issuing of the fiat; and any party lodging a caveat is to have seven days' notice of the next meeting.

The first application for disclaiming part of a specification, has been by petition from Benjamin Rotch, Esq. The following is the course of proceedings:—

"In the matter of a patent granted to Benjamin Rotch, of Lowlands, near Harrow, in the county of Middlesex, Esq., for his invention of 'improved guards or protections for horses' legs and feet, under certain circumstances,' bearing date at Westminster, the 28th day of March, 1830.

"Disclaimers and memorandums of alterations entered by the said Benjamin Rotch with the Clerk of the Patents of England, pursuant to an Act passed in the 5th and 6th years of his present Majesty's reign, intituled, 'An Act to amend the law touching Letters Patent for Inventions.'

"I, the said Benjamin Rotch do hereby declare, that since the inrolment of the specification of the said patent, I have discovered many practical difficulties in the way of applying caoutchouc or Indian rubber, generally, to the protection of horses' feet, and the overcoming of those difficulties is attended with much expense; and I do hereby also further declare, that I have further discovered, since the inrolment of the said specification, that surgical bandages, made of caoutchouc, or Indian rubber, have been applied, by surgeons and others, to the human frame; wherefore I fear that the rings for bandages, which I have described in the said specification as applied to protect wounds on horses' legs from injury in certain cases, may not be considered a new invention, though I am not aware of their having been used prior to the date of my said patent; and for these several reasons aforesaid, I, the said Benjamin Rotch, do hereby disclaim all such parts of my said specification as relate to the application of caoutchouc, or Indian rubber, to horses' feet, or to the application of the same material for elastic rings for keeping other bandages over wounds on horses' legs; that is to say, I hereby disclaim the following words of my said specification, for which reason I also make such alterations in the context as are thereby rendered necessary; namely, in that part of the specification describing the nature of my said invention, I disclaim the words 'and feet,' and introduce the word 'and,' between the word 'cutting' and the word 'from;' and further on, in the same part of the said specification, I disclaim the words, 'and from injury to tender feet or to young feet in certain cases, as also from injury to wounds of the leg in certain cases.' And further on in the said specification where the drawing is described, I disclaim the words, 'E, fig. 1, is a caoutchouc shoe stretched over the hoof by means of its elasticity, and coming up quite into the pastern joint over the heel. This shoe will be found useful for young colts when running in wet ground, or for horses with corns when turned out to grass in dry weather; and if protected at the bottom, with iron or steel, as at D, fig. 2, might be used for breaking or training young colts. Fig. 3, represents the iron cut out of a piece of sheet iron. This is riveted with thin but large flat-headed rivets, as shown at fig. 4, to the bottom of the caoutchouc shoe; and then the parts marked *a*, *b*, *c*, *d*, *e*, *f*, and *g*, bent upwards to the form of the hoof, as shown at D, fig. 2. This sheet-iron guard, or protection to the caoutchouc shoe may be further protected by a small light steel shoe, of the ordinary form, riveted to the bottom of the sheet iron, if required: F, F, fig. 1, represent two caoutchouc rings applied to the leg above and below the hock, to keep on a poultice; and these caoutchouc rings may be applied as bandages to protect wounds, in various ways; their elasticity always preserving a sufficient tightness to the bandage without impeding the necessary circulation.' And further on in the same part of the said specification, I disclaim the words, 'In order to make a shoe, I merely cut off the neck of the bottle, and stretch the remainder on to the mould, made of the shape of the horse's foot on which it is to be used, as shown at fig. 5.' The rings for bandages are merely made by cutting off the top and bottom of the bottle, leaving the part between of the breadth required for the bandage.

"And further on in the said specification, where I describe the mode of applying the invention to the animal, I disclaim the words 'and rings,' and introduce the word 'and' between the word 'boots,' and the word 'knee;' and further on, in the same part of the said specification, I disclaim the words 'and of the shoe being drawn on to its place, notwithstanding its contraction at the fetlock.'

"And further on in the said specification, that is to say, in the claiming clause of the same, I disclaim the words 'feet and.'

"And further, I, the said Benjamin Rotch, do hereby make the following disclaimer of part of the title of my said invention, and for this reason; namely, in order to make the same consistent with what my said specification will describe my said invention to be when such disclaimers and alterations as aforesaid shall have been entered as aforesaid; that is to say, I disclaim the words 'and feet' in the said title.

"In witness whereof, I have hereunto set my hand this 10th day of November, 1835.

(Signed) "BENJAMIN ROTCH."

"To the Clerk of the Patents of England."

"I have this day granted my fiat, giving leave to the above-mentioned Benjamin Rotch to file, with you, the above-written disclaimers and memorandums of alteration.

(Signed) "R. M. ROLFE."

"Lincoln's Inn, December 21, 1835."

SCIENTIFIC NOTICES.

COMMISSION OF INQUIRY INSTITUTED BY ORDER OF THE FRENCH GOVERNMENT, FOR THE REGULATION OF DUTIES UPON, OR PROHIBITION OF, FOREIGN MANUFACTURES, &c.

(Continued from p. 252.)

THE second subject or question submitted to the consideration of the United Chambers of Commerce, &c., is that of pit-coal "Houilles," which, next to that of iron and castings, engages the attention of the Commission. The reduction of the price of an article which affects so many branches of industry is stated to be highly desirable; and it is generally required that the supply of foreign pit-coal should be thrown more open to the French manufacturers.

The Minister of Commerce, in order to direct and elucidate the discussion, gave some preliminary views of the progress of the consumption of pit-coal in France. In 1787, France consumed about fourteen millions of hectolitres, of which one-half was supplied by foreigners; in 1832, the consumption rose to twenty-two millions hectolitres, about sixteen millions of which were produced by France, four and a half millions by Belgium, and one and a half millions by England and Prussia. The Minister submitted to the Commission the following four questions:—

1. Does France contain within herself sufficient quantities of pit-coal to answer all the demands of the country?

2. What has been the production of our collieries during the last thirty years? is their progressive working to be attributed to the protection of duties (upon foreign pit-coal), or to the requirements of the manufactories?*

3. Should a decrease of the price of pit-coal be effected by means of a diminution of the import duties upon foreign coal, or, rather, by improvements in the means of internal transport of native coal?

4. Do not our collieries require the protection of the existing duties?

A lengthened debate upon the first of these questions established by evidence, that the veins of pit-coal throughout France are extremely rich, and that the mines are capable of furnishing supplies considerably beyond our actual consumption.

By means of a map prepared expressly for the occasion, and of irrefragable documents, the Minister demonstrated the seams of pit-coal are so distributed as to be able to supply, with great facility, the various points of France, excepting the three departments of La Meuse, La Moselle, and Des Ardennes, or which the import duty *has been* reduced to eleven centimes.

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* The consumption of pit-coal for domestic purposes is, throughout France, very trifling; the French have a strong antipathy to its use in their houses.—Ed.

This first point being disposed of, the question was discussed—if the French pit-coals were not inferior to foreign coal?

Upon this point, a mass of direct evidence, supplied by many honourable members, established the fact, that for the various uses of domestic and manufacturing purposes, our specimens from the centre and the northern departments have nothing to fear from the rivalry of foreign pit-coal. Still, with the certainty of our possessing every quality of coal, and the actual import duty not hindering the entry of foreign pit-coal, which, at this moment, amounts to one-fourth of our consumption, we should ascertain if it be prudent to facilitate to a greater extent the competition of foreign coal with our home supply.

M. Prâire stated, that the coal-mines of central France alone delivered to the wharfs of the Seine and of the Loire above two millions of hectolitres: that the hectolitre of pit-coal, which costs about 50c. = 5d. at the pit's mouth, was sold at Paris and Nantes at 3½ and 4½ francs = 35d. to 45d.; and that this increased cost was principally owing to the expenses of internal transport.

The actual duty augmented the charge of production in several manufactures, according to the following table, the correctness of which could not, he thought, be disputed:—

Centime.[*]

1 upon 20 yards of calico.
1 " 15 pounds of refined sugar.
1 " 25 " of oil.
1 " 4 " of cotton thread.
1 " 3 " of fine castings (iron).
1 " 7 " of coal smelted iron.
And 1 per 1000 in the manufacture of woollen cloths.

The Minister of Commerce asserted that the central coal mines required protection, and that the total repeal of the foreign duties could not be viewed without alarm; that a reduction of the duties to one-third would scarcely affect the manufacturing interests; and that a diminution of the land frontier duties would lead to a reduction of the maritime duties, which would send English pit coal up the Seine and the Loire, to the great injury of our native collieries.

The marine duty is 1fr. 10c. = 11d., upon the heaped hectolitre imported by French or English ships, and 1fr. 65c. = 1s. 4½d. upon pit coal imported by other ships. The Minister of Commerce concluded by insisting upon the injury to which the native collieries would be subjected by any alteration of the *protecting duty*; that many works did not repay interest upon the capital employed; that if the competition of the French mines were to cease, foreign coals would soon be enhanced in their price; and that it would not be France which would profit by any modification of the duties.

Upon the general question, the three Councils made their reports to the Minister as follows :—

---

[*] 100 centimes make a franc; 5 centimes are equal to our halfpenny.—Ed.

1. The Council-General of Commerce required that the duties to be levied upon foreign pit coal, whether introduced by sea or land, should be reduced one-third; that coal for the express consumption of steam-vessels should be exempt from duty; and that the Government should suppress, in favour of pit coal, the navigation duty.

2. The Council-General of Manufactures thought it indispensable that the duties upon pit coal should be continued. It called only for the suppression of the navigation duties upon the rivers, and desired that those which could not be abolished should be levied upon the ton measure, and not upon the boats; and, finally, it proposed that pit coal destined for the consumption of steam-boats should be delivered at the price at which they entered any entrepôt.

The Council-General of Agriculture voted for the maintenance of the existing tariff, and required an abatement of the tolls or turnpike dues. It called the attention of the Government to the ameliorations which might be introduced in the navigation of the rivers and of the canals.

Two only of these propositions were submitted for adoption to the Chamber of Deputies, in their late session, by M. Meynard, the reporter: viz. the suppression of one-third of the duties upon foreign pit coal, whether introduced by sea or by land, and the privilege to steam-vessels to receive at the entrepôts their necessary supplies of coal upon the simple obligation of re-exportation. The report did not elicit any facts not previously known to the Councils-General of Manufactures, of Commerce, and of Agriculture. Native coal was every where cheap at the pit's mouth, but became dear from the deficiency of facile and cheap transport.

The French editors say, "that it is not known for a certainty, if the Minister of Commerce intends renewing these two propositions in the ensuing sessions of the Chambers, but they feel confident that he will neglect nothing which may tend to elucidate this important question, and to resolve it according to the general interests of the country."

List of Patents

Granted by the French Government from the 1st of April to the 30th of June, 1835.

PATENTS FOR FIFTEEN YEARS.

To Mr. Robert Swansborough, of London, represented in Paris by Mr. Perpigna, advocate, of the French and Foreign Office for Patents, 4, Rue Choiseul, for certain improvements in the construction of the stays and rigging of ships, and in the method of adapting and using them.

— John George Bodmer, engineer, of Bolton-le-Moor, represented in Paris by Mr. Perpigna, for improvements in steam-engines, steam-generators, and furnaces applicable to boilers.

— Miles Berry, of London, represented in Paris by Mr. Perpigna, for improvements, 1st, in stationary or locomotive engines; 2d, in steam generators; 3rd, in the chimneys adapted to the furnaces of such generators.

— Auguste Jean Baptiste Gallais, of Paris, represented by Mr. Perpigna, for a new preparation called lactoline.

— Miles Berry, of London, represented in Paris by Mr. Perpigna, for an improved water level.

— Amassa Stone, of Rhode Island, represented in Paris by Mr. Perpigna, for certain improvements in looms.

To Pierre Auguste Leclerc, of St. Etienne, for a method of melting in large quantities, &c., casting malleable iron.

— Pierre Louis Barbeau, of Chatillon, for a machine for manufacturing plaster of Paris.

— Joseph Marlieu, of Clermont, for an elastic cushion made of caoutchouc, to be substituted to the cushions of billiard tables.

— the Baron Heurteloup, for improvements in fire-arms.

— Robert, of Paris, for an improved lamp.

— Francois Tilleul, of Rennes, for a machine called by him *perpetual motive power*.

— Nicolas Remi Lolot, for improvements in the machines used for making nails.

— Thomas Ulysse Clezeau, of Paris, for a machine for digging wells.

— Francois Opdenbosch, of Brussels, for an improved rotatory steam-engine.

— Thilorlier and Serrhirot, lamp manufacturers, for improvements in lamps.

— John Hind, of Nottingham, for an improved bobbin-net frame.

— Joseph Charpy, of Lyons, for an improved gas lamp.

— Hippolyte Salomon, of Metz, for a new method of printing.

— Girod and Thomann, of Besancon, for improvements in bellows.

— Francois Eugene Flourens, of Paris, for improvements in locomotive waggons to be used on railroads.

PATENTS FOR TEN YEARS.

— William Dutton, gentleman, of Stanley, represented in Paris by Mr. Perpigna, advocate, of the French and Foreign Office for Patents, 4, Rue Choiseul, for certain improvements applicable to stoves and furnaces.

— Jacques Louis Delieuvin, of Incheville, represented by Mr. Perpigna, for improved spindles supported at both ends, and applicable to the throstle frame.

— Jacques Louis Delieuvin, of Incheville, represented by Mr. Perpigna, for improvements in the stretching frames and the jenny mules.

To Sulpice Christophe Breuzin, of Paris, represented by Mr. Perpigna, for an improved self-feeding gas-lamp.

— Antoine Louis Edward Costil, of Brussels, for artificial butterflies and flowers.

— Jean Baptiste Villet, for a new motive power, applicable to various machines.

— Jean Pierre Valdeiron, of Marseilles, for an hydraulic machine.

— Adrien Louis de Bourge, of Bar-le-Duc, for improvements on machines for manufacturing paper.

— Jean Francois Gobert, of Boissy St. Leger, for an improved system of Venetian blinds.

— Antoine Galy Cazalat, of Paris, for an improved lamp, called by him *ethereal lamp*.

— Michael Bouland, M.D., of Paris, for a syrup for purifying the blood.

— Philippe Jossi, of Paris, for an improved coffee-pot.

— John Chanter, of London, for improvements in the furnaces of steam-engines.

— Couturier, Noelagnes, and Lebuhotel, for an improved method of extracting *iode* from the soda made from sea-weeds.

— Pierre Jacques Braff, of Paris, for a method of rendering fabrics water-proof, while they remain permeable by elastic fluids.

— Mathieu Joseph Dessart, of Rheims, for a machine for washing and untwisting the shavings and parings in the manufacturing of shawls.

— Widdowson, Bussel, and Bailey, of Douay, for improvements on the bobbin-net frame.

— Claude Antoine, of Montrouge, for an improved apparatus for distilling the pulp of apples after it has passed through the press.

— Jean Baptiste Cessier, for improvements in the construction of detonating fire-arms.

— Camille Verrier, of Amiens, for a new power created by levers put in action successively, and producing a perpetual motion.

To Leistein Schneider, of Poncey-les-Pilleroy, for improvements in machines used for manufacturing continuous paper.

— Charles Joseph Bruneel, of Lyons, for improvements in fire-arms to be loaded at the breech, or at the mouth.

— Leonor Thomas de Manneville, of Honfleur, for an improved kind of sawing-mill.

— Augustin Maugenest, of Paris, for a medicinal composition, called by him *wine of Maugenest.*

— Protte and Bajon, glovers, of Paris, for an improved method of manufacturing gloves.

— Richard Scott, of London, for improvements in the construction of taps, or cocks, with keys.

— Herouerd-l'Hermenont, of Couture, for an improved head for the German flute.

— Jean Salières, of Carcassonne, for a machine for preparing with ease and expedition, the warp of woollen cloth.

— Martin and Champonnois, of Arras, for an improved method of manufacturing beet sugar.

— Jacques Saes, of Strasbourg, for a method of manufacturing black silk handkerchiefs, in imitation of those of Milan and Elberfeldt.

PATENTS FOR FIVE YEARS.

— Paul Armand Francois Monvalle, represented by Mr. Perpigna, advocate, of the French and Foreign Office for Patents, 4, Rue Choiseul, for an improved elastic pen-holder.

— Jean George Stolz, of Paris, for a continuous sieve with a fixed cylinder and internal shakers, for extracting fecula from potatoes.

— Lassalle and Bellock, for improvements applicable to stationary or moveable fire-grates.

— Lescœur and Jallade, of Lyons, for a mechanical inking apparatus, applicable to that kind of printing press which is worked by the hand.

— Pauwells and Co., of Paris, for a system of levers applicable to steam-engines.

To Julien Benjamin Roussel, of Versailles, for a new motive power, applicable to locomotion.

— Dubost, Brothers, of Lyons, for a new kind of mechanism, applicable to the stocking-frame.

— Felix Hoyes, of Lille, for a new kitchen stove.

— Alexander Bouché, architect, of Paris, for a rotatory steam-engine.

— Adrien Florentin Nicolli, of Yvetot, for certain improvements applicable to weaving frames.

— Jean Pierre Chavassieux, of Lyons, for a machine for manufacturing ropes of the greatest and of the smallest dimensions.

— Antoine Jeannot, of Paris, for a new method of locking the wheels of carriages.

— John Leavers, and Erckmann, of Grand-Couronne, for a method of manufacturing net with a blond-lace mesh, in silk, thread, or cotton, on the ordinary bobbin-net frame.

— Benoit Alais, of Feurs, for a new kind of rail for rail-roads.

— Laurent, architect, of Beaucaire, for a portable windmill.

— Quentin-Francois Goin, of St. Quentin, for a method of manufacturing blond-lace with large meshes, either in silk or cotton, on the circular net-frame.

— Pierre Jauffret, of Solon, for a new kind of manure.

— Laurent Emile Durand, of Ganges, for a method of stifling cocoons, by means of the sulphurated hydrogen gas.

— Cesar Augustin Ducote, of Louviers, for improvements in carding machines.

— Jean Louis Thomas Cartier, of Corbeil, for a moveable cylinder, heated with steam, for purifying blasted corn.

— Michel Nicolas Georget, of Arras, for an apparatus for extracting the saccharine juice from beet-root.

— Leon Armand, of Cahors, for a new process of compounding and disinfecting manure.

— Alexandre Triger, of Paris, for a machine for making pin-nails.

New Patents
SEALED IN ENGLAND,
December, 1835.

To John Fussell, of Nunney, in the county of Somerset, edge-tool maker, for his invention of improvements in pumps.—Sealed 29th December—6 months for inrolment.

To Joseph Skinner, of Fen-court, in the city of London, civil engineer, for his invention of improvements in machinery for cutting wood for veneers, and other purposes.—Sealed 29th December—6 months for inrolment.

To John Hyde, of Ashton-under-Lyne, in the county of Lancaster, cotton-manufacturer, for his invention of improvements in machinery for carding cotton and other fibrous substances.—Sealed 31st December—6 months for inrolment.

To Pierre Erard, of Great Marlborough-street, in the county of Middlesex, musical-instrument maker, for his invention of certain improvements on piano-fortes and other keyed musical instruments, for the term of seven years, to be computed from the 22nd day of December, inst., being an extension of former Letters Patent for the aforesaid invention, granted to the said Pierre Erard by his late Majesty King George the Fourth.—Sealed 31st December.

To John Blyth, of the parish of St. Anne, Limehouse, in the county of Middlesex, engineer, for his invention of an improved method of retarding the progress of carriages in certain cases.—Sealed 31st December—6 months for inrolment.

To Theodore Lyman Wright, of Sloane-street, in the parish of St. Luke, Chelsea, in the county of Middlesex, gent., for a certain improvement or certain improvements, in machinery or apparatus for cleansing, purifying, and preparing feathers and down for domestic uses, and in the process or method of effecting the same, being a communication from a foreigner residing abroad.—Sealed 31st December—6 months for inrolment.

1836.

To James Champion, of Salford, in the county-palatine of Lancaster, machine-maker, for his invention of certain improvements in machinery for spinning, twisting, and doubling cotton, and other fibrous substances. —Sealed 6th January—6 months for inrolment.

To John Ramsbottom, of Todmorden, in the county-palatine of Lancaster, mechanist, for his invention of certain improvements in machinery for roving, spinning, and doubling cotton, and other fibrous substances. —Sealed 6th January—6 months for inrolment.

To William Harter, of Manchester, silk-manufacturer, for his invention of certain improvements in machinery for winding, cleaning, drawing, and doubling hard and soft silk.—Sealed 8th January—6 months for inrolment.

To Francis Brewin, of the Kent-road, in the county of Surrey, tanner, for his invention of certain new and improved processes of tanning.—Sealed 11th January —6 months for inrolment.

To J. Tilton Slade, of Fitzroy-square, in the county of Middlesex, gent., for his invention of certain new or improved machinery for raising earth, and for other useful purposes.—Sealed 11th January—6 months for inrolment.

To John Ward Higham, of Tavistock-street, in the parish of St. Giles-in-the-Fields, in the county of Middlesex, for his invention of an improved tablet for sharpening of razors, penknives, surgical instruments, chisels, plane irons, and other steel instruments, which are capable of being sharpened by what are commonly called hones, Turkey stones, or Welch stones.—Sealed 11th January—2 months for inrolment.

To John Burns Smith, of Salford, in the county of Lancaster, cotton-spinner, and John Smith, of Halifax, in the county of York, dyer, for their invention of a certain method or methods of tentering, stretching, or keeping out cloth to its width, made either of cotton, silk, wool, or any other fibrous substances, by machinery.—Sealed 14th January—6 months for inrolment.

To Moses Poole, of Lincoln's-inn, in the county of Middlesex, gent., for improvements in Jacquard looms, being a communication from a foreigner residing abroad. —Sealed 19th January—6 months for inrolment.

To Charles Brandt, of Upper Belgrave-place, in the county of Middlesex, mechanist, for his invention of certain improvements in heating, evaporating, and cooling fluids.—Sealed 19th January—6 months for inrolment.

To Francis Moll, of Grove Lane-terrace, Camberwell, in the county of Surrey, esq., for his invention of improvements in preserving certain vegetable substances from decay.—Sealed 19th January—6 months for inrolment.

To Charles Harsleben, of Bold-street, Liverpool, in the county-palatine of Lancaster, esq., for his invention of certain improvements in the machinery and arrangements for the use of propelling vessels and other floating bodies, as also carriages and other vehicles on rail-roads, as well as on common roads, part of which machinery is also applicable to other purposes.—Sealed 19th January—6 months for inrolment.

To Robert Bowie, of Bishopsgate-street Within, in the city of London, surgeon, for his invention of certain improvements in distillation and decoction; which improvements are, more or less, applicable to the heating of fluids of all descriptions, as also to the purification of oleaginous bodies, both animal and vegetable. Sealed 21st January—6 months for inrolment.

To John Ferrabee, of the Thrupp, in the parish of Stroud, in the county of Gloucester, engineer, and Richard Clyburn, of the same place, engineer, for their invention of certain improvements in power-looms.—Sealed 21st January—6 months for inrolment.

To William Burch, of the Borough-road, in the county of Surrey, calico and silk printer, for his invention of certain improvements in machinery for printing silk and cotton, net or lace.—Sealed 23rd January—6 months for inrolment.

To Julius Jeffreys, of Osnaburgh-street, Regent's-park, in the county of Middlesex, esq., for his invention of improvements in curing or relieving disorders of the lungs.—Sealed 23rd January—6 months for inrolment.

To Henry Booth, of Liverpool, in the county of Lancaster, gent., for his invention of improvements applicable to locomotive steam-engines, and railway carriages.—Sealed 23rd January—2 months for inrolment.

To Henry Pickworth the younger, of Sipson, in the county of Middlesex, gent., for his invention of certain improvements in machinery for propelling vessels and other floating bodies moved by steam or other power.—Sealed 26th January—6 months for inrolment.

CELESTIAL PHENOMENA, FOR FEBRUARY, 1836.

D.	H.	M.	
1			Clock before the ☉ 13m. 50s.
	—		☽ rises 8h. 5m. A.
	—		☽ passes mer. 11h. 41m. A.
	—		☽ sets 7h. 31m. M.
2	6	50	Ecliptic oppo. or ○ full moon.
3			Occul. 42 Leonis, im. 12h. 49m., em. 14h. 5m.
	13	38	☿ in the ascending node.
4	15	33	♃'s first sat. will em.
5			Clock before the ☉ 14m. 17s.
	—		☽ rises 8h. 7m. A.
	—		☽ passes mer. 2h. 7m. M.
	—		☽ sets 9h. 7m. M.
	13	10	♃'s third sat. will im.
	16	24	♃'s third sat. will em.
	—		Occul. β Virginis, im. 13h. 58m.
6	3	31	☿ greatest elong. 18. 12. E.
	7	5	♂ in conj. with υ in Capri.
	10	20	♃'s first sat. will em.
7			Occul. in Virginis, im. 15h. 38m., em. 16h. 45m.
8	3		☿ in Perihelion.
	12	12	♄ in conj. with ☽ diff. of dec. 0. 55.
10			Clock before the ☉ 14m. 32s.
	—		☽ rises 1h. 31m. M.
	—		☽ passes mer. 6h. 5m. M.
	—		☽ sets 10h. 27m. M.
	1	52	☽ in □ or last quarter.
	8	4	♃'s second sat. will em.
	—		Occul. γ Ophiuchi, im. 15h. 8m., em. 16h. 11m.
12	1	34	☿ stationary.
13	1		☽ in Perigee.
	11	57	♃'s first sat. will em.
	23	7	♄ stationary.
15			Clock before the ☉ 14m. 29s.
	—		☽ rises 7h. 15m. M.
	—		☽ passes mer. 11h. 7m. M.
	—		☽ sets 3h. 8m. A.
	4	44	♂ in conj. with the ☽ diff. of dec. 3. 57.
	6	25	♃'s first sat. will em.
16	8	18	Ecliptic conj. or ● new moon.
	10	49	♅ in conj. with the ☽ diff. of dec. 4. 34.
	19	44	☿ in conj. with the ☽ diff. of dec. 8. 51
17	10	41	♃'s second sat. will em.
18			Mercury R. A. 22h. 27m. dec. 5. 59. S.
	—		Venus R. A. 0h. 6m. dec. 0. 17. S.
	—		Mars R. A. 21h. 7m. dec. 17. 36. S.
	—		Vesta R. A. 12h. 24m. dec. 8. 50. N.
	—		Juno R. A. 6h. 19m. dec. 7. 32. N.
	—		Pallas R. A. 20h. 7m. dec. 4. 1. N.
	—		Ceres R. A. 21h. 9m. dec. 22. 36. S.
	—		Jupiter R. A. 6h. 26m. dec. 23. 26. N.
	—		Saturn R. A. 14h. 15m. dec. 10. 51. S.
	—		Georg. R. A. 22h. 11m. dec. 12. 0. S.
	11	15	☿ greatest Hel. Lat. N.
	19	11	♀ in conj. with the ☽ diff. of dec. 3. 30.
19	14	11	♅ in conj. with the ☉
20			Clock before the ☉ 14m. 7s.
	—		☽ rises 8h. 50m. M.
	—		☽ passes mer. 3h. 13m. A.
	—		☽ sets 9h. 52m. A.
	13	52	♃'s first sat. will em.
	—		Occul. μ in Piscium, im. 9h. 30m., em. 10h. 24m.
21	16	39	☿ in inf. conj. with the ☉
	23	1	☿ in conj. with ♅ diff. of dec. 4. 46.
22	8	20	♃'s first sat. will em.
24			Occul. τ Tauri, im. 11h. 0m.
	11	46	☽ in □ or first quarter.
	13	18	♃'s second sat. will em.
	24	20	☽ in Apogee.
25			Clock before the ☉ 13m 17s.
	—		☽ rises 11h. 0m. M.
	—		☽ passes mer. 7h. 49m. A.
	—		☽ sets 3h. 44m. M.
26	14	9	♃ in conj. with the ☽ diff. of dec. 3. 14.
29	10	16	♃'s first sat. will em.

J. LEWTHWAITE, Rotherhithe.

METEOROLOGICAL JOURNAL,

FOR DECEMBER, 1835, AND JANUARY, 1836.

1835.	Thermo.		Barometer.		Rain in inches.	1836.	Thermo.		Barometer.		Rain in inches.
	Hig.	Low.	High.	Low.			Hig.	Low.	High.	Low.	
Dec.						Jan.					
26	27	13	30,28	30,27		10	32	28	29,63	29,23	
27	36	12	30,19	30,17		11	36	26	29,28	29,21	
28	46	32	30,08	30,02		12	33	24	29,52	29,37	,8
29	42	31	30,20	30,13		13	38	22	29,82	29,73	
30	46	37	30,21	30,14		14	49	34	29,84	29,68	
31	33	20	30,22	Stat.		15	43	39	29,58	29,41	,525
1836. Jan.						16	39	27	30,14	29,99	,075
1	33	25	30,40	30,21		17	41	24	30,25	30,15	
2	29	7	30,55	30,52		18	43	26	30,18	29,92	
3	41	22	30,42	30,31		19	37	29	30,25	30,12	,025
4	49	36	30,15	30,11	,025	20	41	20	30,20	30,08	
5	51	41	30,19	30,13		21	41	29	29,95	29,68	
6	47	41	30,15	30,11		22	47	29	29,54	29,52	,025
7	40	29	29,92	29,87	,025	23	54	43	29,73	29,38	,05
8	41	29	29,95	29,88	,025	24	49	38	30,01	29,92	
9	34	25	29,94	29,82		25	43	30	30,28	30,22	

Edmonton. CHARLES HENRY ADAMS.

Latitude 51° 37 32 N.
Longitude 3 51 West of Greenwich.

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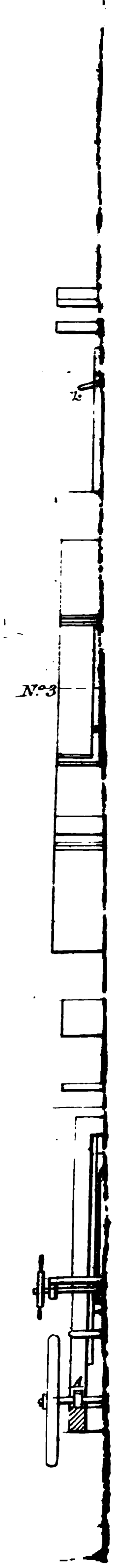
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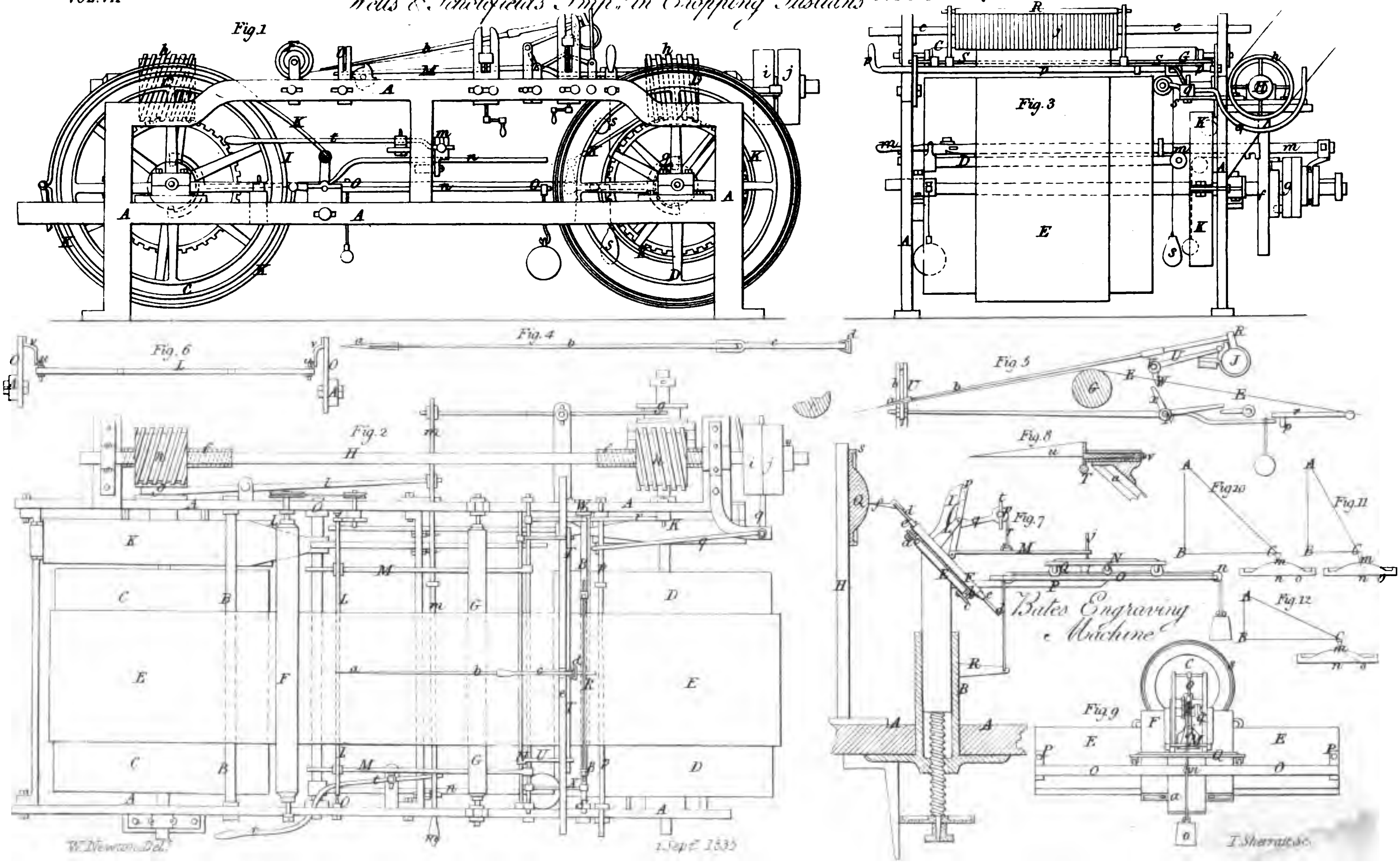

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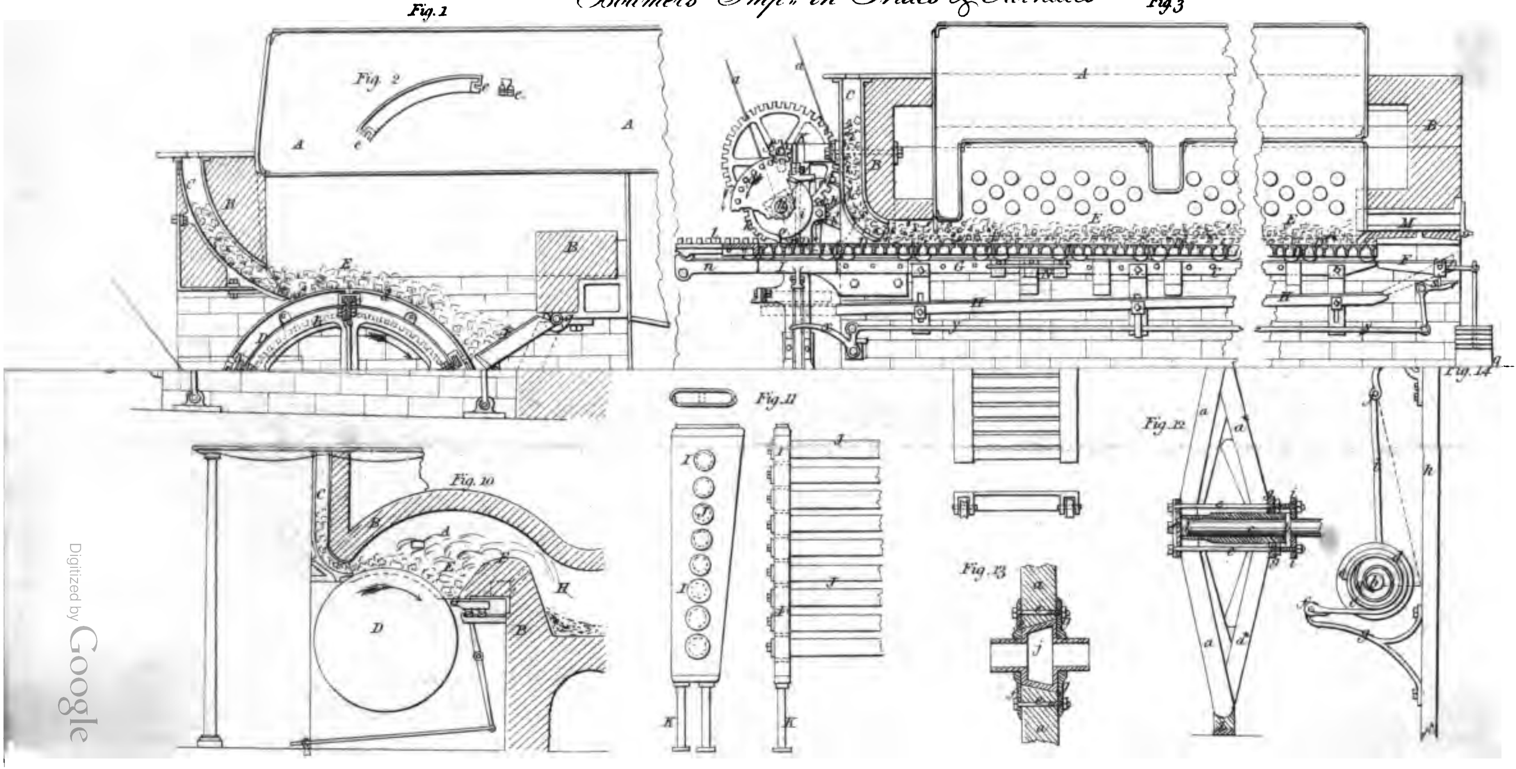
Bodmer's Imp.ts in Grates & Furnaces



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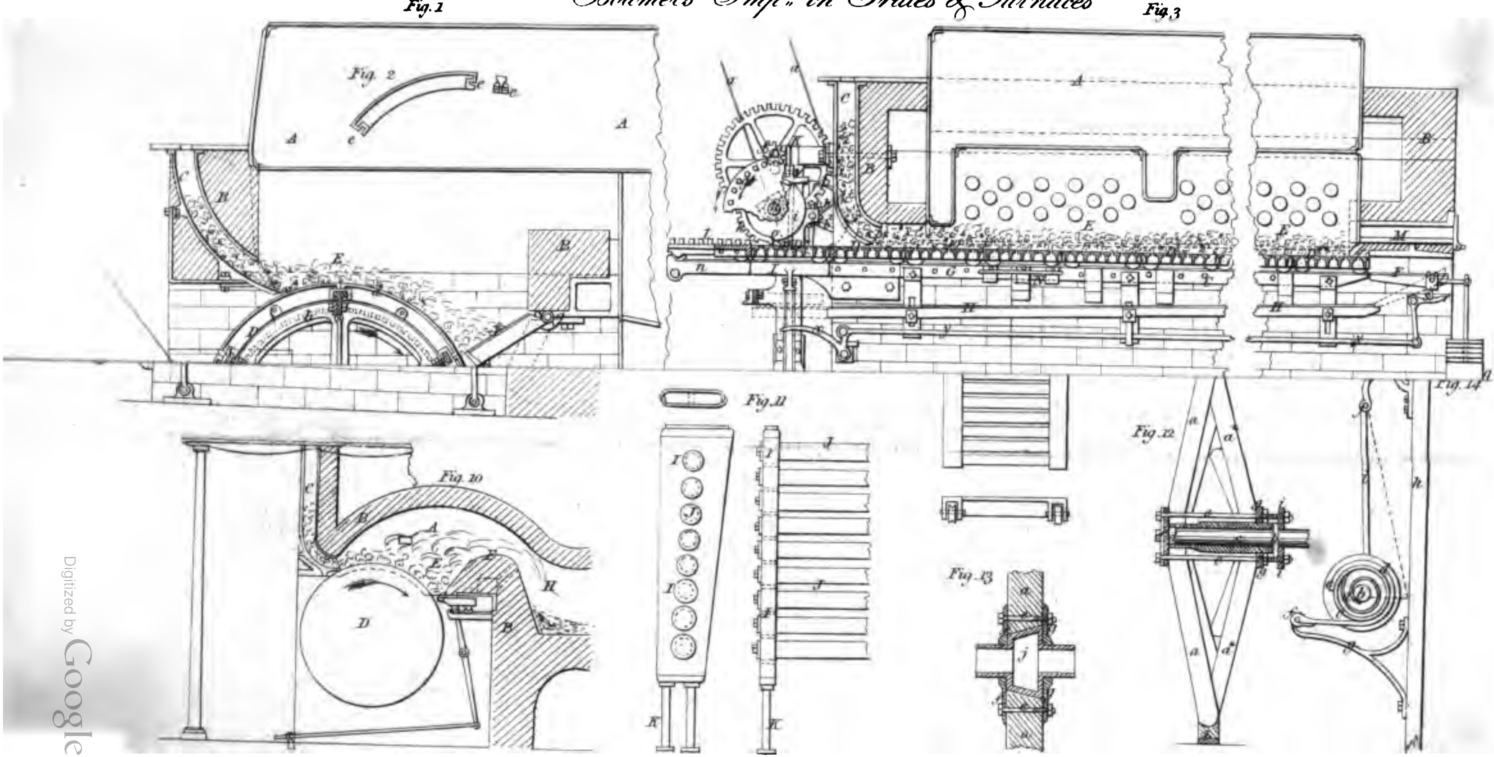
Bodmer's Imp.ts in Grates & Furnaces



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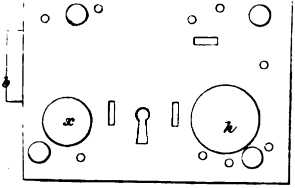
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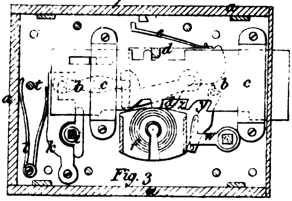
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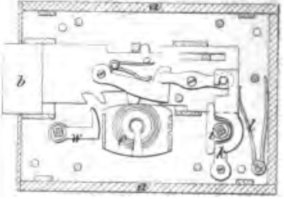
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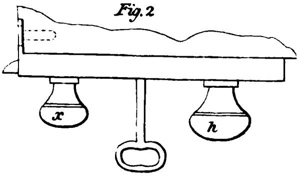
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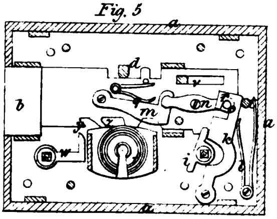
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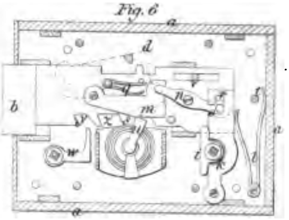
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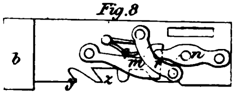
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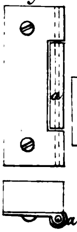
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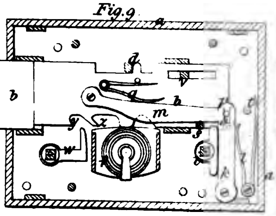
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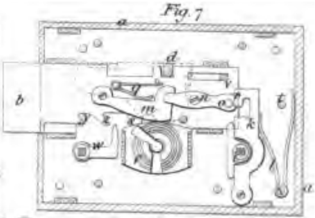
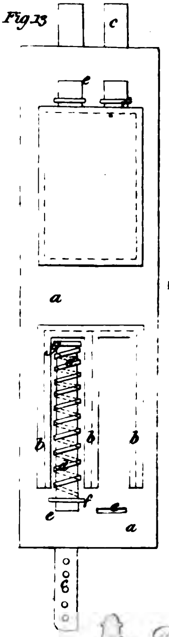


Fig. 7

Colman's Roller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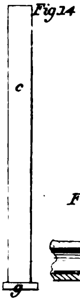
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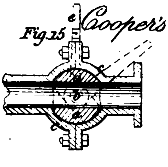
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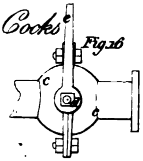
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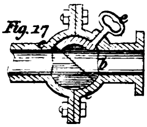
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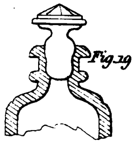
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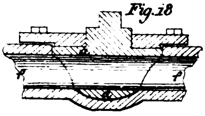
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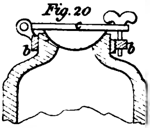
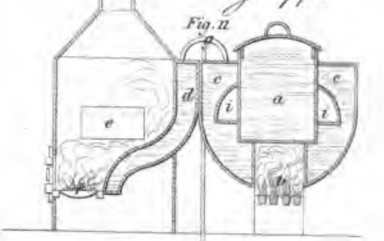


Fig. 20

Westrupp & Gulbin's Impd. Distilling Appts.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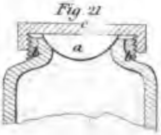
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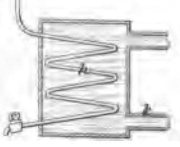

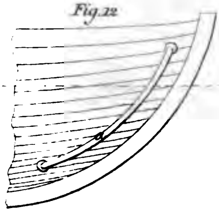
Fig. 12

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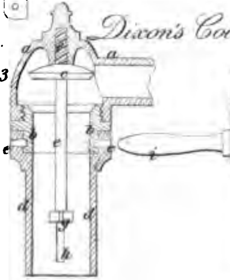
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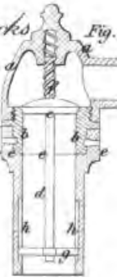


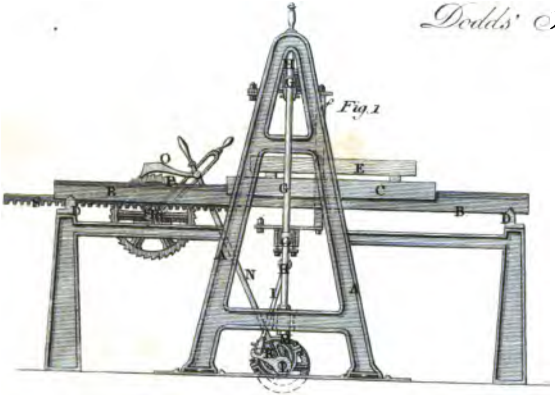
Fig. 22

W. Newton Delt. 1 Octr. 1835. T. Sherrat Sc.

CONJOINED SERIES

Dodds' Imp.ts in Cutting Wood

Fig. 1



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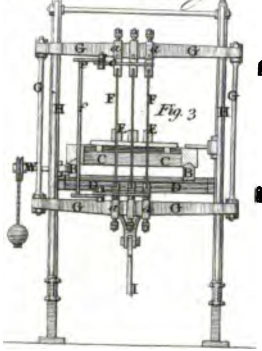

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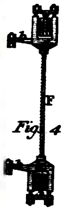

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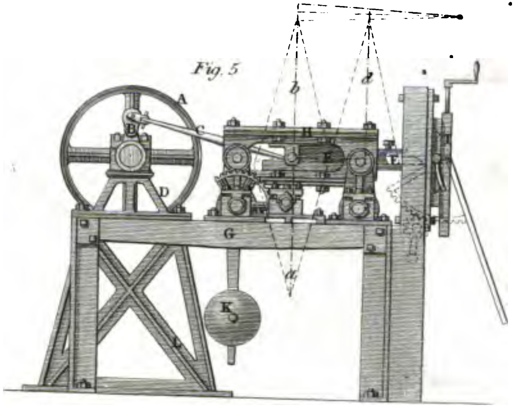

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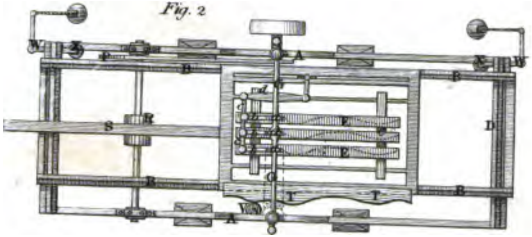

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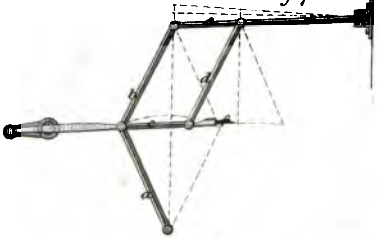

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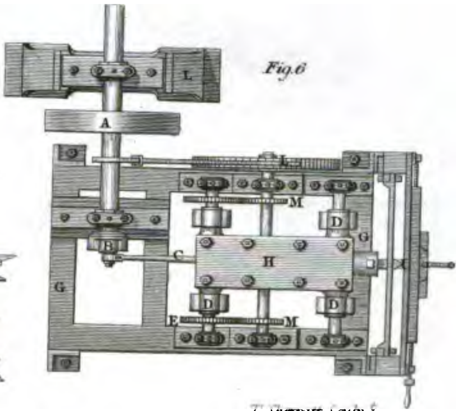

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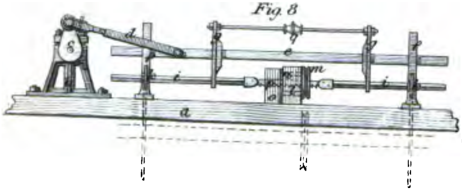

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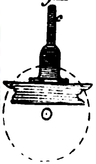

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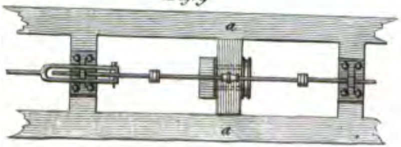

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2nd Nov.r 1835.

T. Sherratt Sculp.t

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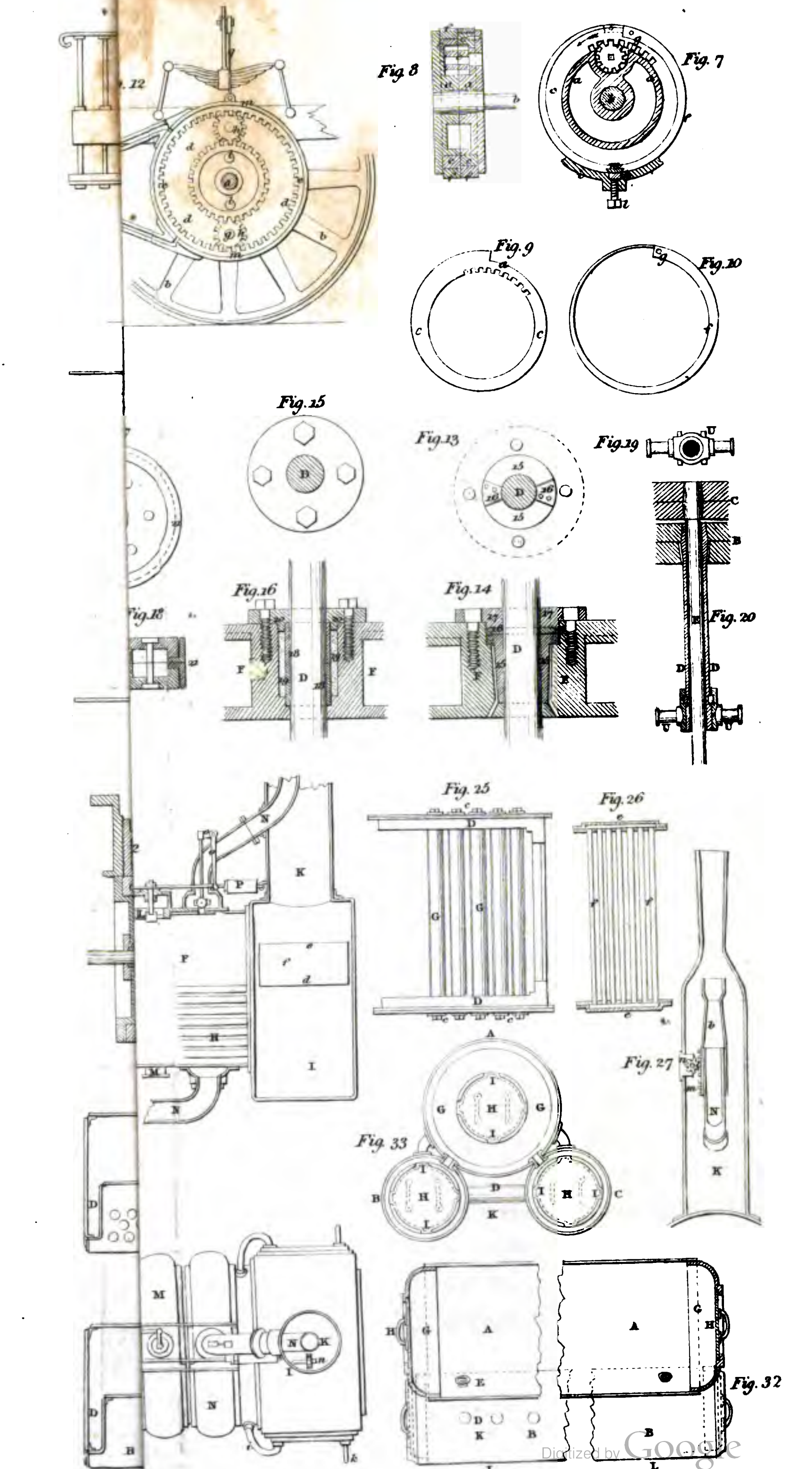
PLATE VI.



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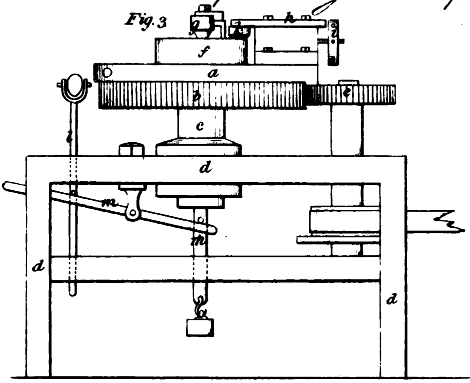
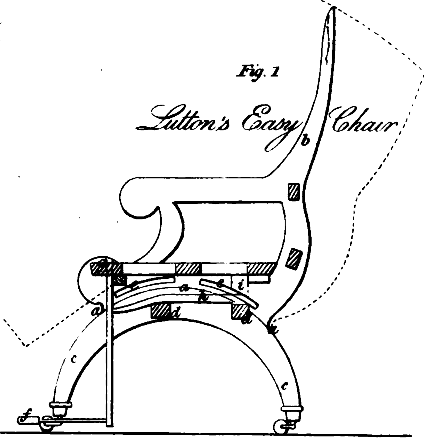
Stocker's Machine for making Shoe Tips

Fig. 3



Sutton's Easy Chair

Fig. 1



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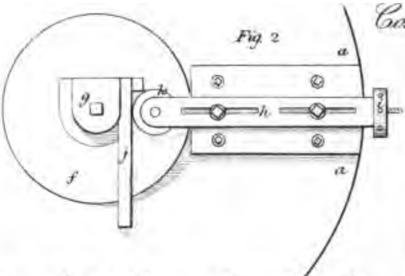
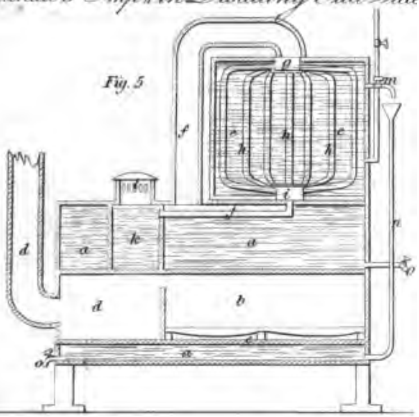


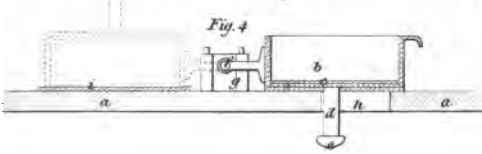
Cosnahan's Impts. in Distilling Salt Water

Fig. 5



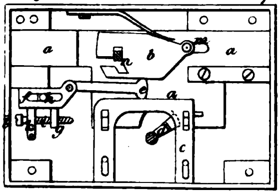
Beart's Appts. for making Bricks

Fig. 4



Parson's Improved Locks

Fig. 6



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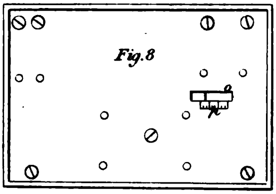

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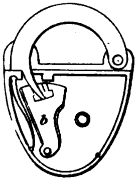
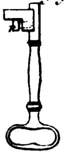


Fig. 9



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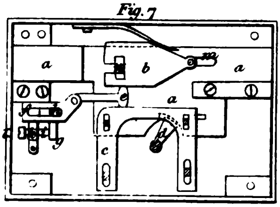
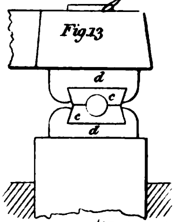


Hardy's Impd. Axletrees

Fig. 13



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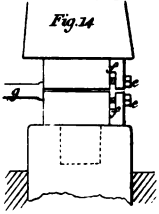

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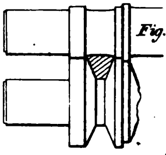

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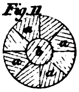

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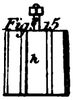

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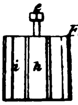


Boys' Drag

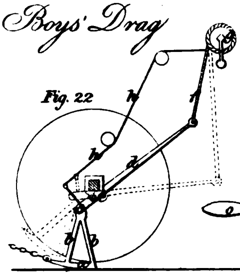


Fig. 22

Clayton's Dough Machine

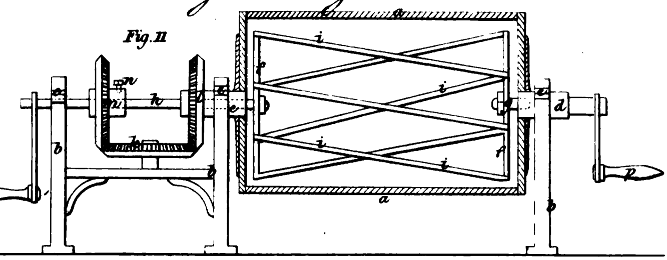


Fig. 11

Bickford's Blasting Rocks

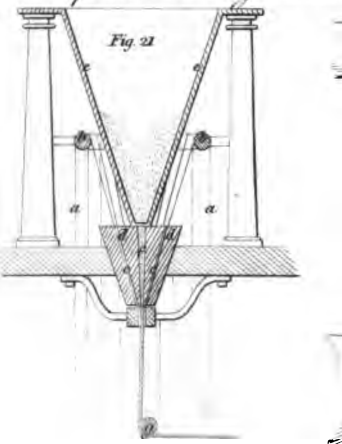


Fig. 21

Somerville's Gun Lock

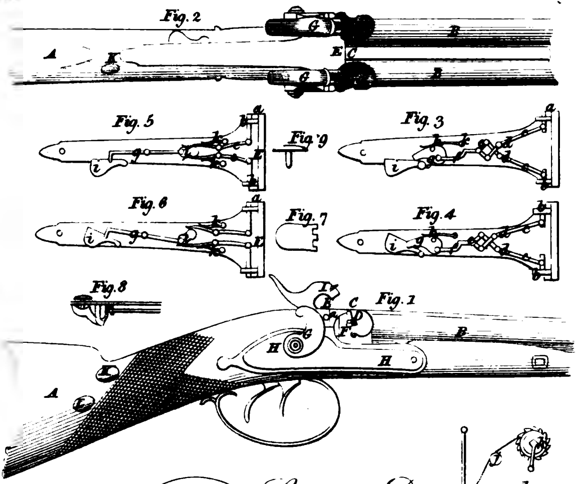


Fig. 2
Fig. 5
Fig. 9
Fig. 3
Fig. 6
Fig. 7
Fig. 4
Fig. 8
Fig. 1

Williams's Drag

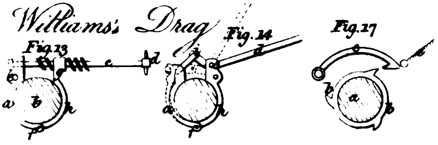


Fig. 13
Fig. 14
Fig. 17

Simpson's Drag

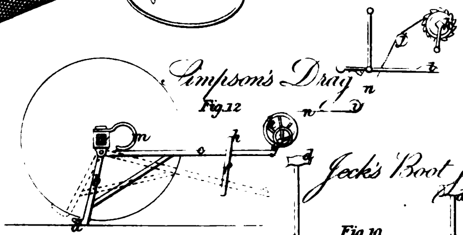
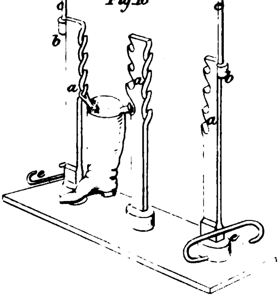


Fig. 12

Jeck's Boot Jack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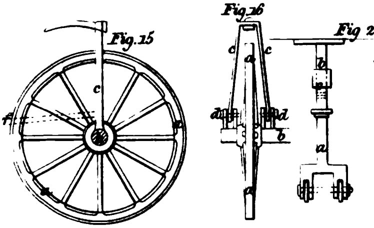


Fig. 15
Fig. 16
Fig. 20

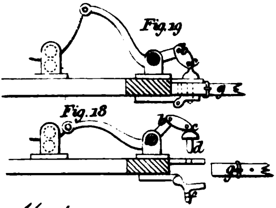
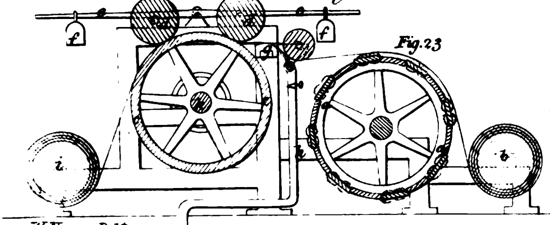


Fig. 19
Fig. 18

Daniell's Cloth Dressing Machine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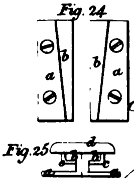


Fig. 24
Fig. 25

Nettlefold's Table Fasten

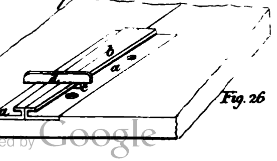
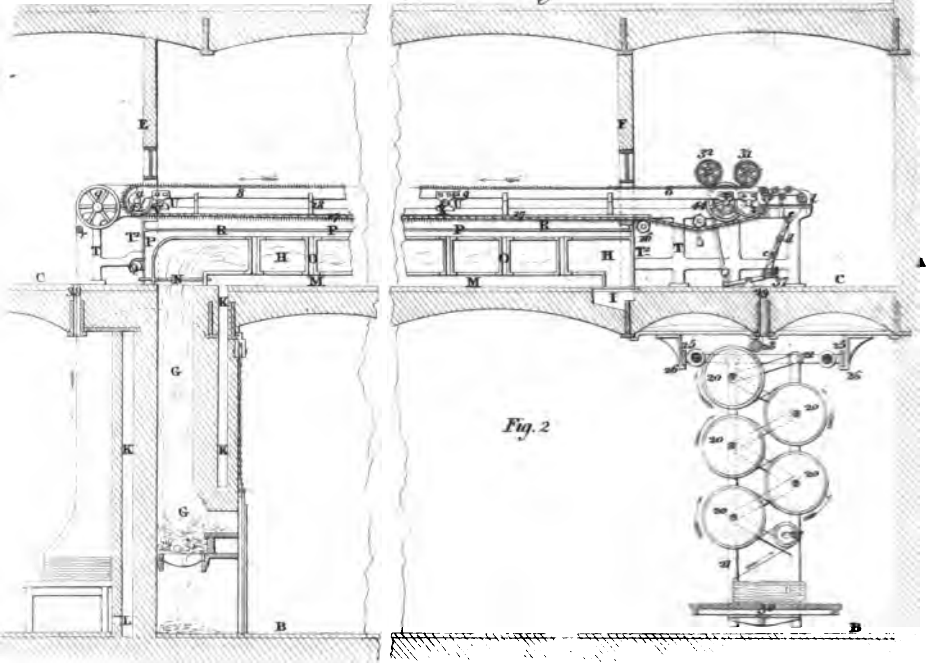


Fig. 26

W. Newton Del^t. 1 Dec^r. 1835 S. Bellin Sc.

Morand's Impd. Stretching Machine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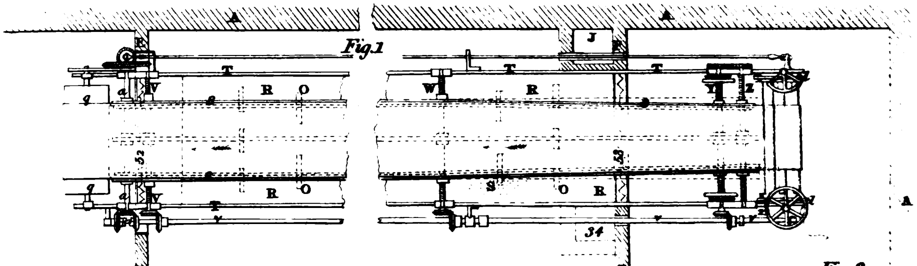
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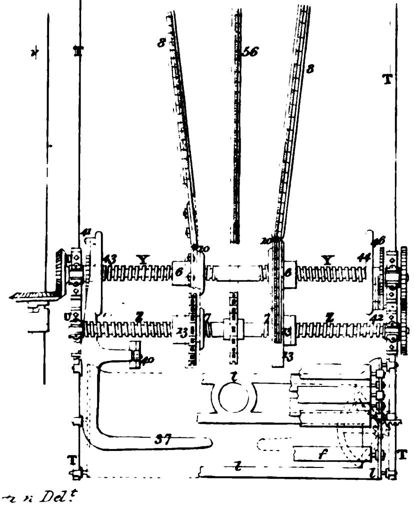
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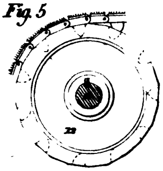
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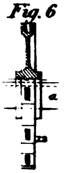
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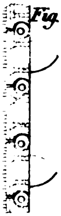
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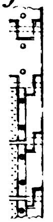
Fig. 9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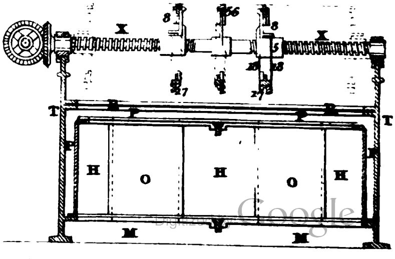
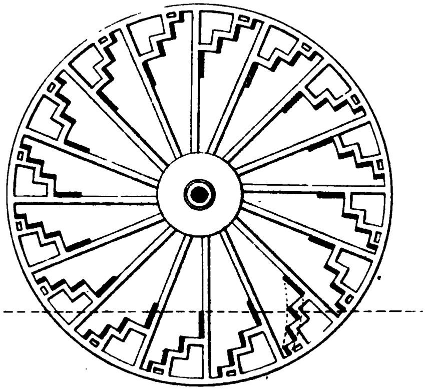


Fig. 3

Fenn ... Delt. 1 Decr. 1835 J. S. Perry

Field's Improved Cycloidal Paddle Wheel

N.º 1



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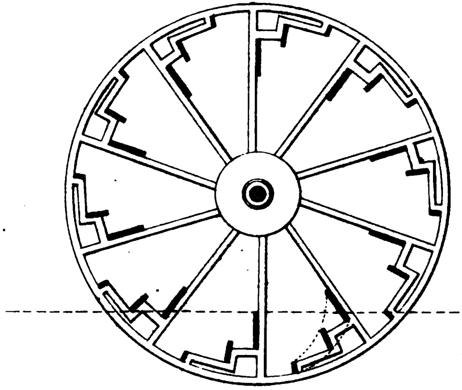

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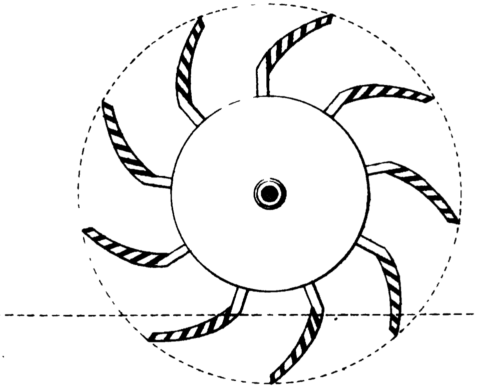
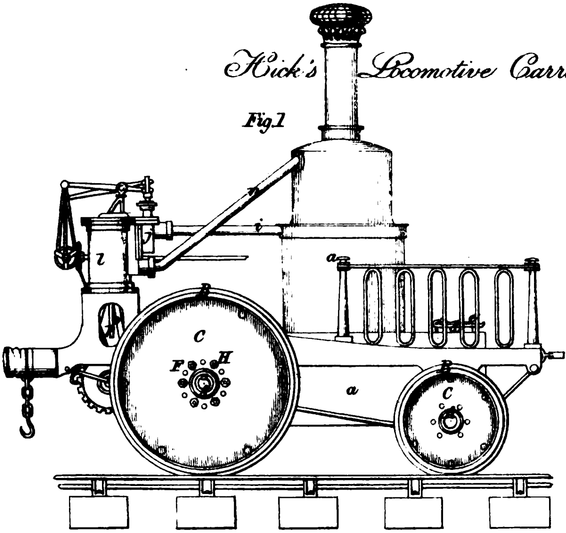


W. Newton Delᵗ. 1 Decʳ. 1835. J. S. Perrin Sc.

Hick's Locomotive Carriage

Fig. 1



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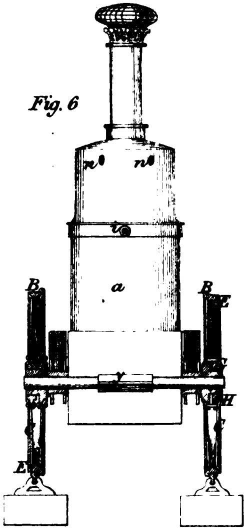

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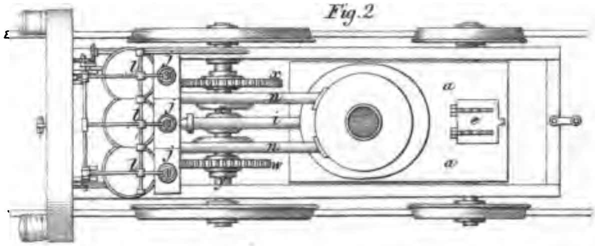

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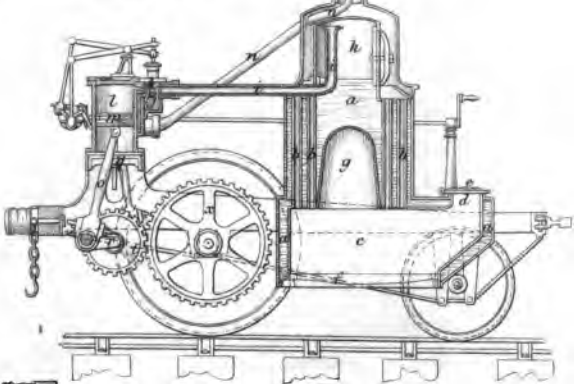

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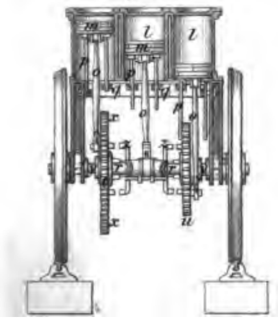

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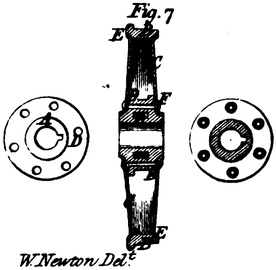

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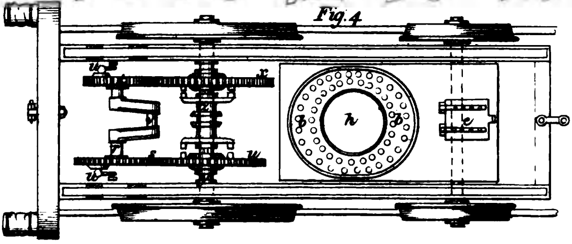
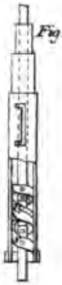


W. Newton Del.t 1. Jan.y 1836. T. Sherratt Sc.

Barker's Impᵈ Umbrellas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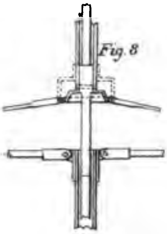
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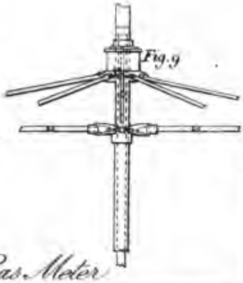
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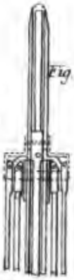
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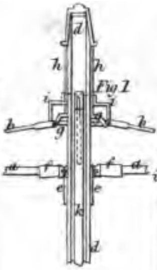
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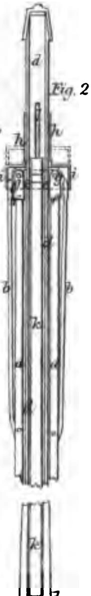
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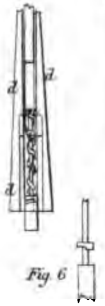
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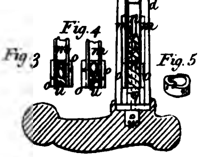
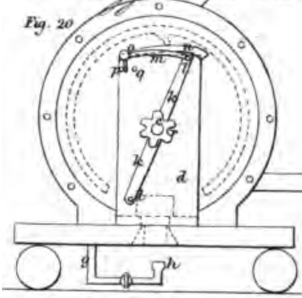


Fig. 3
Fig. 4
Fig. 5

Clegg's Impᵈ Gas Meter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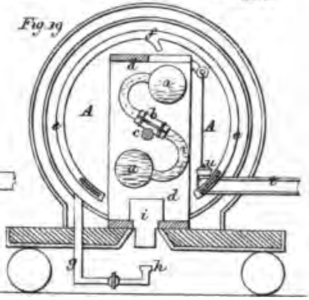
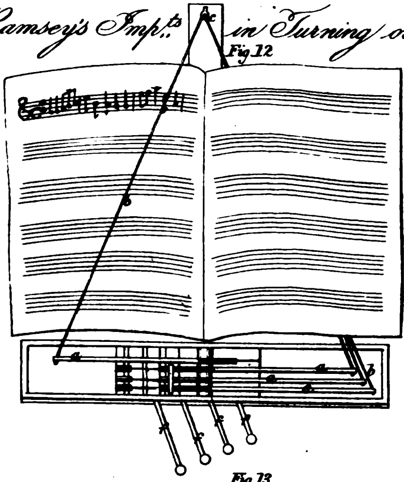


Fig. 19

Ramsey's Impᵗˢ in Turning over Music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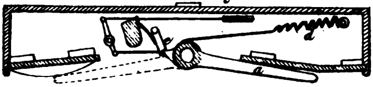


Fig. 13

Courderoy's Appˢ for Making Bread

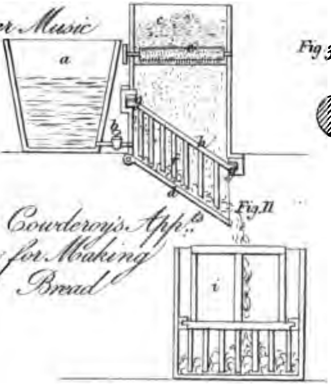
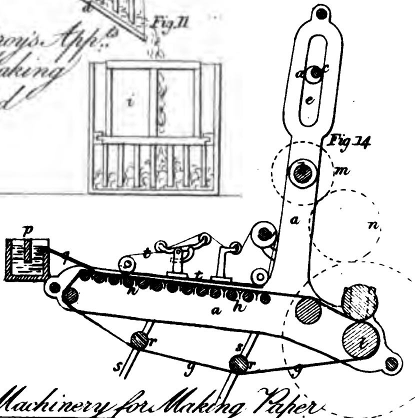


Fig. 11

Barrat's Impᵈ Machinery for Making Paper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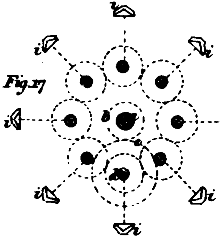
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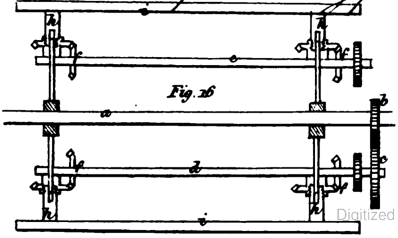
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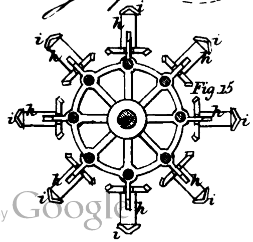


Fig. 15

Beale's Impts in Lamps

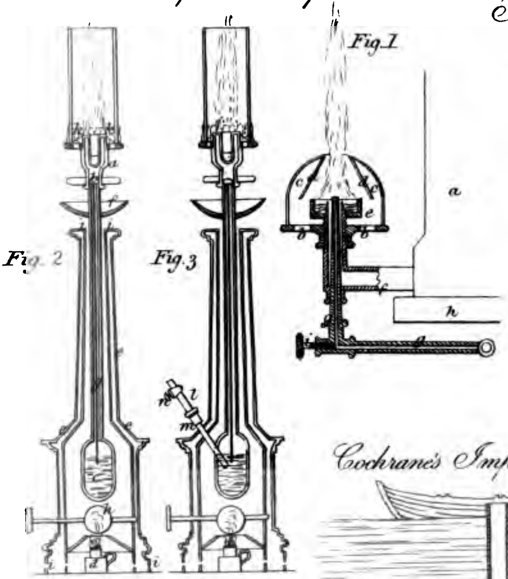


Fig. 1

Fig. 2

Fig. 3

Hardwick's Impts in Paddle Wheels

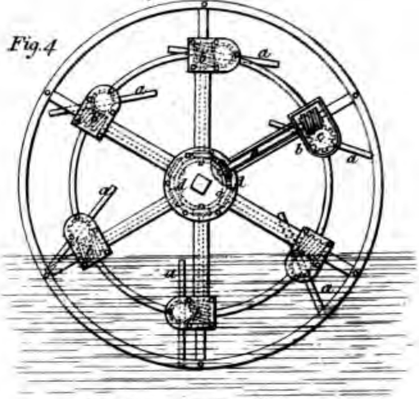


Fig. 4

Cochrane's Impts in Mining

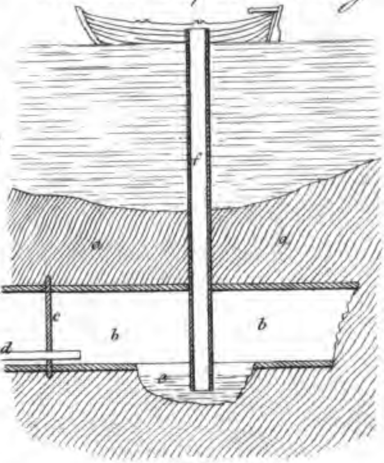


Fig. 5

Notts Impts in Stoves

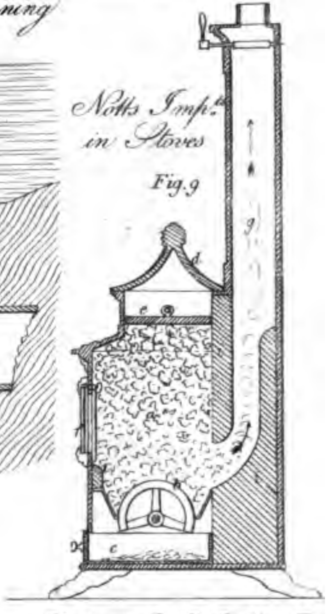
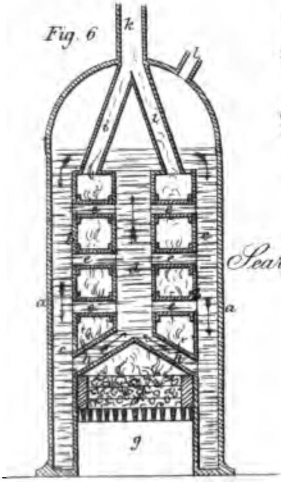


Fig. 9

Searle's Impts Boiler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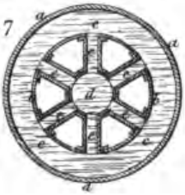


Fig. 7

Parker's Impts Coffee Pot

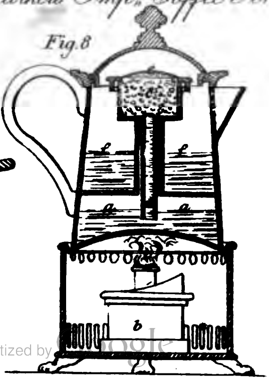


Fig. 8

Hartleys' Impts in making Glass

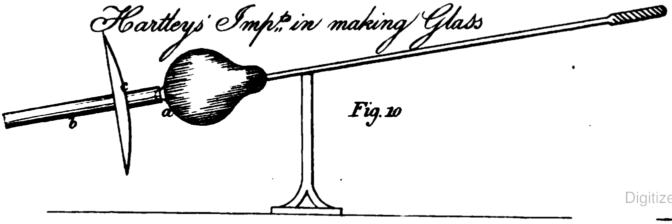
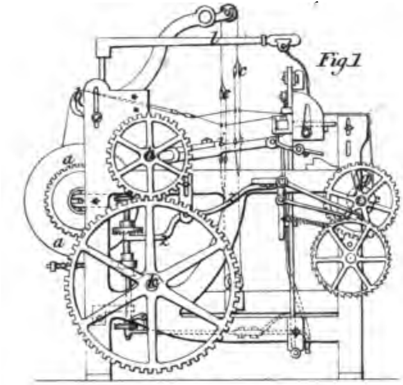


Fig. 10

W.Newton Delt   1 Jany 1836.   J.S.Perring Sc.

Stone's Improved Loom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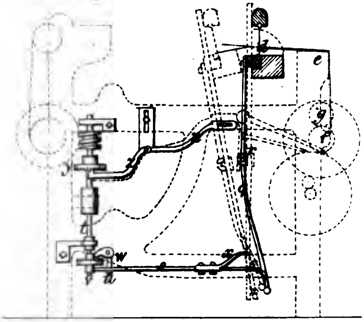
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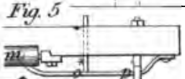
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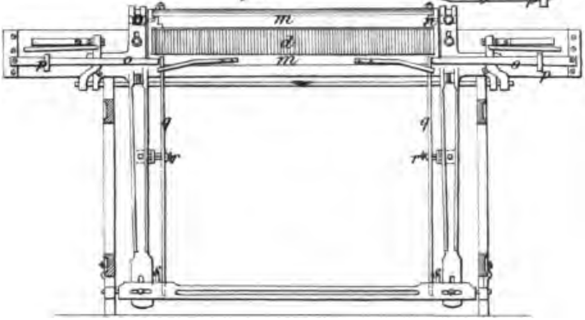
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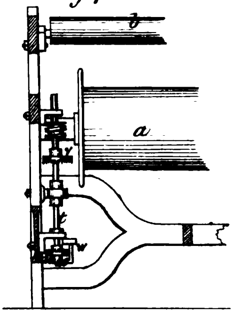


Fig. 4

Wolf's Imp.ts in Piano Fortes

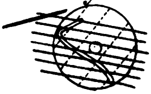
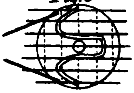


Fig. 6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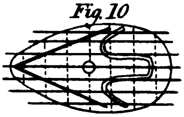
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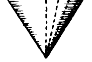
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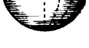
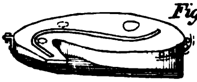


Fig. 9

Fig. 11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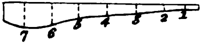
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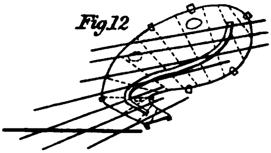
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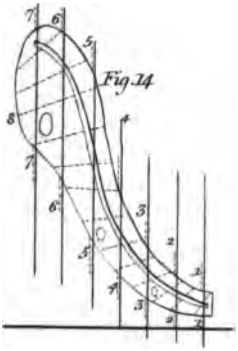
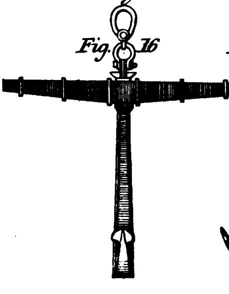


Fig. 14

Rodger's Imp.d Anchor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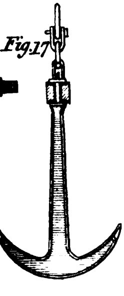
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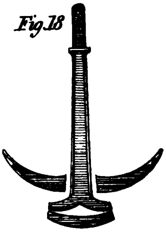
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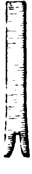
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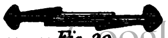
Fig. 20

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Smith's Imp.d Metallic Rigging

Fig. 2

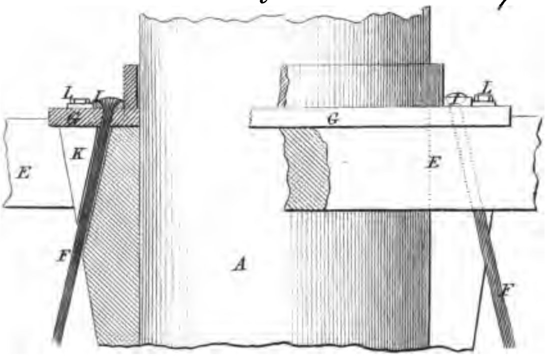
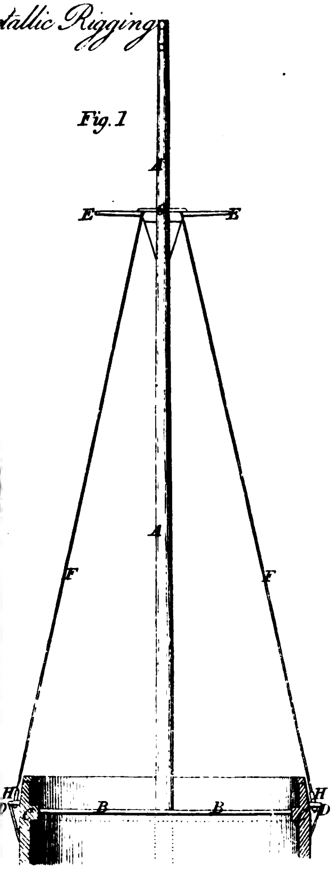


Fig. 1



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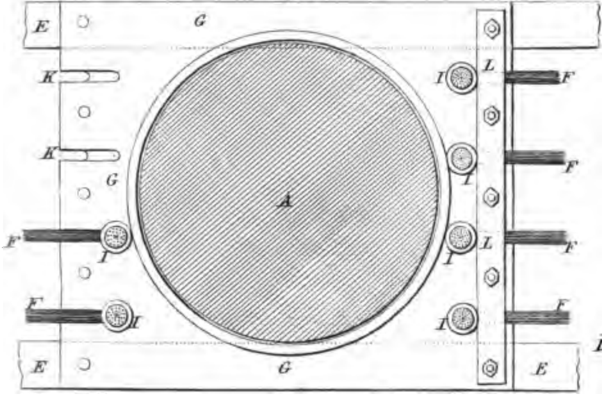


Fig. 6

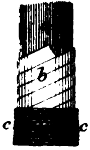
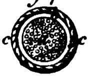


Fig. 7



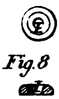
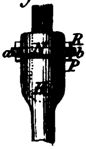


Fig. 8

Fig. 11



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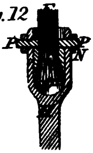

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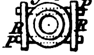

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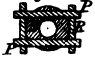
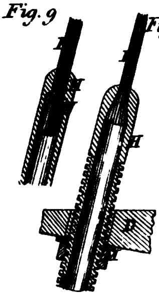


Fig. 9

Fig. 5



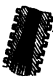
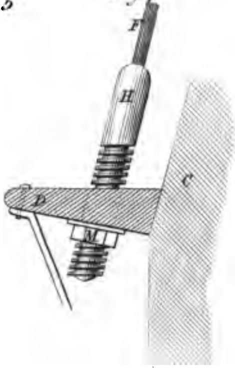


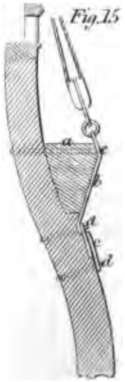
Fig. 10

Fig. 4



Couch's Imp.d Ships Channels

Fig. 15



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